405693

ENIWETOK ATOLL

1 ½ 0 1 2 3 4 5 6 7 8 9 10
NAUTICAL MILES

OCEAN

ELUGELAB
TEITEIRIPUCCHI
BOGAIRIKK
BOGOD
SAMILDEFONSO
COCHITI
ZUCHI
BOGOMBOGO
BOCALLUA
NOAH
IRENE
HELEN
GENE
FLORA
EDNA
DAISY
CLARA
BELLE
ALICE
ENGEBI
MUZINBAARIKKU
KIRINIAN
BOKONAARAPPU
YEIRI
AITSU
TRUJORU
EBERIRU
AOMON
BIIJIRI
ROJOA
AARAANBIRU
PIIRAAI
PERCY
LUCY
KATE
JANET
NANCY
MARY
PEARL
OLIVE
WILMA
VERA
URSULA
OSCAR
ILDA
SALLY
RUBY
RUNIT
SAM
TOM
URIA
VAN
ZONA
YVONNE
CHINIEER
ANIYAAN
ALVIN
BRUCE
CLYDE
CHINIMI
JIERORU
REX
DAVID
JAPTAN
DEEP ENTRAN
ELMER
PARRY
WALT
SAND
FRED
ENIWETOK
RIGILI
LEROY
KEITH
JAMES
IRWIN
HENRY
GLENN
GIRINIEN
RIBAION
POKON
MUI
IGURIN
WIDE PASSAGE

VARIATION - 6° 15' E. (1948)

CORAL HEAD (MACK)

LAGOON

REPOSITORY NATIONAL ARCHIVES PACIFIC SOUTHWEST REGION
COLLECTION RG 326 ATOMIC ENERGY COMMISSION
BOX No. 199679 (#1089) A16429 326-65A-170
4-8 LAST FOLDER FOR BOX 65A170
FOLDER A16429 - FIRST TAB ENIWETOK ATOLL - LAST TAB FORMS

Misc. 310

~~OFFICIAL USE ONLY~~

~~OFFICIAL USE ONLY~~

MARINE LANDING AND BEACHING INFORMATION
FOR ALL SITES
ENIWETOK ATOLL

ALICE — LCMs and LCUs beach on sand bar through break in reef. Require plus 1.5 tide or under. Tracked equipment and vehicles only.

Channel Markings: None at present.

CLARA — LCMs beach on sand bar through break in reef. Require plus 1.5 tide or under. Tracked equipment and vehicles only.

Channel Markings: None at present.

GENE
HELEN
IRENE — Causeway out between HELEN and GENE. Landings for LCUs and LCMs on west side of GENE. LCMs can beach at IRENE but require a plus 2.5 tide. IRENE and HELEN connected by causeway. Old channel at GENE useable but not recommended.

Channel Markings: None.

JANET — LCMs and LCUs at any tide.

Facilities: Hard sand ramp. (Note: Freight pier in damaged condition, not recommended for use until repairs made.)

Channel Markings: None.

KATE — LCMs requirea plus 1.5 tide and LCUs require a plus 3.0 tide.

Facilities: Sandy beach landing.

Channel Markings: None.

LUCY — LCMs require a plus 1.5 tide and LCUs require a plus 3.0 tide.

Facilities: Sandy beach landing.

Channel Markings: None

~~OFFICIAL USE ONLY~~

MARINE LANDING AND BEACHING INFORMATION FOR ALL SITES (Cont'd)

MARY

LCMs can enter at any tide. LCUs require a plus 2.0 tide.

Facilities: Sandy beach landing.

Channel Markings: None.

NANCY
OLIVE
PEARL

LCT (Only) require a plus 2.0 tide.

Facilities: Sandy and coral beach landing.

Channel Markings: None.

RUBY
SALLY
TILDA
URSULA

Connected by causeway. Entrance channel at URSULA. LCMs and LCUs can enter at any tide.

Facilities: Freight pier and concrete ramp.

Channel Markings: One lighted entrance buoy (Fl.-W.) and eleven channel buoys. (Oil drums; 6 red and 5 black.)

Note: The channel to the causeway landing between TILDA and URSULA and the channel to the damaged pier at SALLY have sanded in and are not being used. (Some old channel marking buoys are still in place.)

WILMA

LCMs can enter at any tide. LCUs require a plus 2.0 tide.

Facilities: Sandy beach landing.

Channel Markings: None.

YVONNE

LCMs, LCUs, and YTLs (Tugs) can enter at any tide.

Facilities: Freight pier and [illegible] ramp.

Channel Markings: One lighted entrance buoy (Fl. W.).

~~OFFICIAL USE ONLY~~

~~OFFICIAL USE ONLY~~

MARINE LANDING AND BEACHING INFORMATION FOR ALL SITES (Cont'd)

ZONA — DUKW's only.

ALVIN
BRUCE
CLYDE — LCMs can enter at any tide. LCUs require a plus 2.0 tide.

Facilities: Sandy beach landing.

Channel Markings: None.

DAVID — LCMs, LCUs, and YTLs (Tugs) can enter at any tide.

Facilities: Freight pier and a sandy beach landing.

Channel Markings: None.

ELMER — LCMs, LCUs, and YTLs (Tugs) can enter at any tide.

Facilities: Freight pier, personnel pier and two concrete ramps.

Channel Markings: None.

FRED — LCMs, LCUs, and YTLs (Tugs) can enter at any tide.

Facilities: Freight pier, personnel pier, 40 feet concrete ramp by personnel pier and sand ramp by freight pier.

Channel Markings: One clearance buoy just off the personnel pier.

GLASS
HENRY
IRVIN
JAMES
KEITH — LCMs (Only) require a plus 2.0 tide.

Facilities: Rock coral beach landing. (Sandy in spots.)

Channel Markings: None. (Note: Not used very much.)

~~OFFICIAL USE ONLY~~

~~OFFICIAL USE ONLY~~

MARINE BEACHING AND LANDING INFORMATION FOR ALL SITES (Cont'd)

LAMOT

LCMs require a plus 2.0 tide and LCUs require a plus 4.0 tide.

Facilities: Sandy beach landing

Channel Markings: One large nun buoy (Red #2) and four other channel buoys (oil drums) (3 red and 1 black).

Note: Red nun buoy #2 serves also as a mooring buoy for LCMs. Keep all red buoy close to starboard when entering channel. Beaching area is between the last red buoy (#8) and only black buoy (#7).

OSCAR

LCMs (Only) at any tide.

Facilities: A ladder is at the southeast side of tower.

Channel Markings: None.

MACK

LCMs and LCUs at any tide.

Facilities: Landing platform is at the north side of tower base.

Channel Markings: None.

~~OFFICIAL USE ONLY~~

HOLMES & NARVER, Inc.

~~OFFICIAL USE ONLY~~ Survey Department ~~OFFICIAL USE ONLY~~

Bench Marks - Site Elmer

Bench Mark	Elev.	F.B.	Pg	Date	Remarks
Firehouse	17.590	229	12	10/27/54	
(Cross Cut in Conc. Door Pad)					
B.M. #1, Parry	24.951	229	12	10/27/54	Setting
(On Conc Slab in compound around Bldg. #311)					
P.I. "H"	13.208	229	9	10/21/54	Disc
(In Center of Heavy Equip. Storage yard)					
P.I. "Elm"	12.229	229	9	10/21/54	Disc
(In front of Bldg #162 Opp. P.O.L. Area)					
P.I. "B"	11.578	229	9	10/21/54	Disc
(Nr. Southwest Corner P.O.L. Fence.					
P.I. "C"	11.426	229	9	10/21/54	Disc
(In roadway at center of West P.O.L. Area Fence)					
P.I. "D"	11.593	229	9	10/21/54	Disc
(Nr. Northwest Corner of P.O.L. Area Fence)					
Tria Sta "Parry"	8.656	229	9	10/21/54	Disc
(Opposite Bldg. #229 in Marine Equip Storage yard)					
Mon. "Morry"	14.224	229	18	12/3/54	Disc
(Near Sawmill Next to Road)					
Mon. "Magnetic"	13.323	229	19	12/3/54	Disc
(North Airstrip Shoulder)					
R.M. 50'	13.246	229	19	12/3/54	Disc
(Off Edge of Airstrip Shoulder)					
R.M. 100'	13.691	229	19	12/3/54	Disc
(100 ' From Magnetic, in line with R.M. 50')					
Mon. "Manley"	12.994	229	20	12/3/54	Disc
(South and East of Bldg. #130)					
Mon. "Baldwin"	11.006	229	21	12/3/54	Disc
(South and East of Bldg #120 - Near Fence)					
R.P. for P.I. #23	12.872	229	14	11/26/54	L & T In Conc
(Near North East Corner CMR Area Fence-Lagoon Side)					
P.I. "L"	11.064	229	14	11/26/54	Disc
(Due North of Bldg #347 - CMR Salt Water Pumps)					
P.I. #25	10.848	229	15	11/26/54	Disc
(North of Sta 1131 Nr Assembly Area Gates)					
P.I. #26	9.732	229	15	11/26/54	Disc
(South End of Island Near Generator Shed and Water Tower)					
P.I. "M"	17.973	229	15	11/26/54	Disc
(Top of hill opposite Power House near Bldg 218)					

All Bench Marks indicated as discs are standard 2 5/8" Brass markers imbedded in a concrete monument approximately 6" below Existing ground grades

~~OFFICIAL USE ONLY~~

HOLMES & NARVER, Inc

Survey Department

Bench Marks - Site Fred

Bench Mark	Elev	F.B.	Pg.	Date	Remarks
Top Tide Staff	9.72	229	23	11/22/54	
Tria. Sta. Eniwetok	11.02	229	23	11/22/54	Disc In Conc Mon
U.S.C. & G.S. B.M. #1	9.515	229	23	11/22/54	Disc In Conc Mon
U.S.C. & G.S. B.M. #2	11.21	229	23	11/22/54	Disc In Conc Mon
P.I. "Pansy"	10.39	229	23	11/22/54	Disc In Conc Mon
U.S.C. & G.S. B.M. #3	10.875	229	23	11/22/54	Disc in Conc Mon
P.O.L. #7	10.075	236	4	10/13/54	Al Bolt in Road
P.O.L. #17	9.95	236	4	10/13/54	Al Bolt in Road
P.O.L. #16	9.71	236	4	10/13/54	Al Bolt in Road
P.I. "Agnes"	9.39	236	4	10/13/54	Al Bolt in Road
P.O.L. #506	10.09	236	5	10/13/54	Al Bolt in Road
B.M. #6	10.28	236	5	10/13/54	Disc in Conc Mon
P.O.L. #113	10.03	236	5	10/13/54	Al Bolt in Road
P.I. "Mabel"	10.67	236	5	10/13/54	Al Bolt in Road
P.O.L. #54	10.17	236	5	10/13/54	Al.Bolt in Road
P.I. "Tulip"	11.67	236	6	10/13/54	Disc in Conc Mon
P.I. #15	12.06	236	6	10/13/54	Disc in Conc Mon
Disc in Conc Nr Old P.I. #16	9.50	236	6	10/13/54	Disc in Conc Mon
P.I. #17	11.14	236	7	10/13/54	Disc in Conc Mon
P.I. #18	12.29	236	7	10/13/54	Disc in Conc Mon
P.I. #19	14.075	236	7	10/13/54	Disc in Conc Mon
P.I. #20	9.58	236	7	10/13/54	Disc in Conc Mon
P.I. "Linda"	10.63	236	10	10/23/54	Al Bolt in Road
Eniwet "B"	10.825	236	10	10/23/54	Disc in Conc Mon

Bench Mark	Elev	F.B.	Pg.	Date	Remarks
P.I. "Becky"	11.49	236	10	10/23/54	Al Bolt in Road
P.I. "B"	9.68	236	10	10/23/54	Disc in Conc Mon
Eniwet "C"	13.87	236	11	10/23/54	Disc in Conc Mon
P.I. "Sue"	13.31	236	11	10/23/54	Al Bolt in Road
P.O.L. #73	13.88	236	11	10/23/54	Al Bolt in Road
P.I. "E"	14.78	236	11	10/23/54	Disc in Conc Mon
P.I. "Delia"	14.675	236	11	10/23/54	Al Bolt in Road
P.I. #12	11.79	236	11	10/23/54	Disc in Conn Mon
P.O.L. "Taxi"	9.445	236	12	10/23/54	Al Bolt in Taxiway
P.O.L. "Bay"	11.26	236	12	10/23/54	Disc in Conc Mon
P.I. "Port"	12.37	236	13	10/23/54	Disc in Conc Mon
Eniwet "A"	15.06	236	13	10/23/54	Disc in Conc Mon
P.O.L. #67	16.83	236	20	11/20/54	Al Bolt in Road
P.I. "F"	15.94	236	20	11/20/54	Disc in Conc Mon
P.I. "Judy"	18.31	236	20	11/20/54	Al Bolt in Road
H&N Disc Conc Mon	14.77	236	20	11/20/54	
P.I. "Lana "	14.21	236	21	11/20/54	Al Bolt in Road
P.I. "Karen"	13.125	236	21	11/20/54	Al Bolt in Road
P.I. #6	9.61	236	21	11/20/54	Disc in Conc Mon
P.I. "Lily"	13.36	236	22	11/20/54	
P.I. #8	10.55	236	22	11/20/54	Conc Mon
Mon "Air"	10.997 (11.00)	236	22	11/20/54	Conc Mon
P.O.L. "Wing"	9.40	236	23	11/20/54	Conc Mon
P.O.L. "Strut"	8.53	236	23	11/20/54	Conc Mon
P.O.L. "Flap"	7.50	236	24	11/20/54	Conc Mon
P.O.L. "Bomb"	7.37	236	25	11/20/54	Conc Mon

BENCH MARKS

SITE	STATION	ELEV	FIELD BOOK	PAGE	DATE	DESCRIPTION		REMARKS
ALICE	BOGA #2	8.675	20	21	1-10-50	H&N DISC, CONC. MON.	F.S. 516	CLOSED CIRCUIT FROM STA. BOGA (STA. BOGA, TIDE OBSERVATIONS)
BELLE	P.I. "A"	8.06	148	22	10-12-51	COPPER PIPE, LEAD & TACK, CONC. MON.	F.S. 522	RUN FROM BOGA #2
	P.I. "E"	8.16	151	25	11-14-51	H&N DISC, CONC. MON.	F.S. 537	CLOSED CIRCUIT FROM P.I. "A"
CLARA	P.I. "R"	6.57	157	2	2-15-52	H&N DISC. CONC. MON.	F.S. 550	CLOSED CIRCUIT FROM P.I. "E"
	RUCHI	9.72	157	16	2-20-52	ALUM. PIPE & CAP, CONC. MON.	F.S. 550	CLOSED CIRCUIT FROM P.I. "R"
DAISY	PYNE	7.80	157	16	2-20-52	ALUM. PIPE & CAP, CONC. MON.	F.S. 554	CLOSED CIRCUIT FROM P.I. "R"
	CHITI	8.39	157	16	2-20-52	ALUM. PIPE & CAP, CONC. MON.	F.S. 554	CLOSED CIRCUIT FROM P.I. "R"
EDNA	SAM	6.87	158	5	2-26-52	ALUM. PIPE & CAP, CONC. MON	F.S. 555	CLOSED CIRCUIT FROM CHITI
	FONSO	(8.86	158	5	2-26-52	ALUM. PIPE & CAP,	F.S. 555	CLOSED CIRCUIT FROM CHITI
		(8.53	158	7	2-27-52	CONC. MON.	F.S. 555	CLOSED CIRCUIT FROM ELUG
FLORA	R.P. "X"	8.965	164	17	5-8-52	ALUM. PIPE & CAP, CONC. MON.		CLOSED CIRCUIT FROM ELUG
	ELUG	8.115	152	5	11-20-51	H&N DISC, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	ELAB	10.09	152	5	11-20-51	H&N DISC, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
GENE	PUCCHI	9.215	152	20	12-3-51	H&N DISC, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	INTER "X"	8.07	152	20	12-3-51	H&N DISC, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	TENT POLE T	6.81	155	12	2-1-52	ALUM. PIPE & CAP, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	TEITEIR	8.545	158	20	3-1-52	H&N DISC, CONC. MON.	F.S. 543	TIDE OBSERVATIONS
HELEN	BOGAIR	6.51	152	20	12-3-51	ALUM. PIPE & CAP, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	RIKK	5.29	152	20	12-3-51	ALUM. PIPE & CAP, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
IRENE	JIM	6.59	156	26	2-14-52	ALUM. PIPE & CAP, CONC. MON.	F.S. 543	CIRCUIT NOGOB TO BOGON
	NOGOB	5.75	152	20	12-3-51	ALUM. PIPE & CAP, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	BOGON	7.15	152	20	12-3-51	H&N DISC, CONC. MON.	F.S. 543	CLOSED CIRCUIT FROM TEITEIR
	MART	10.99	156	26	2-14-52	ALUM. PIPE & CAP,	F.S. 543	CIRCUIT NOGOB TO BOGON
JANET	ENGEBI	10.08	10	18	5-14-59	U.S.C.&G.S., CONC. MON.	F.S. 73	TIDE OBSERVATIONS
	LADEDA	9.76	43	14	6-2-50	H&N DISC, CONC. MON.	F.S. 73	CLOSED CIRCUIT FROM ENGEBI
	T.A.K.	9.39	69	23	9-13-50	NAIL IN CONC. MON.	F.S. 73	CLOSED CIRCUIT FROM ENGEBI
	R.P. 4	9.09	168	7	4-28-52	20MM SHELL IN CONC. MON.	F.S. 73	CLOSED CIRCUIT FROM ENGEBI
	R.P. 3	9.86	168	27	5-3-52	H&N DISC, CONC. MON.	F.S. 73	CIRCUIT, TANKS TO R.P. 4

BENCH MARKS

SITE	STATION	ELEV	FIELD BOOK	PAGE	DATE	DESCRIPTION	REMARKS
FRED	B.M. 53-J	11.78	LIST OF VALID BENCHES			S.W. COR SLAB BLDG. #84	
	B.M. 53-K	15.67	LIST OF VALID BENCHES			S.E. COR. OF W. STEP BLDG. #90	
	P.I. #6	8.55	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. #8	10.49	208	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. #10	15.33	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. #12	11.81	204	17	6-1-53	STANDARD H&N DISC IN CONC.	
	P.I. #15	12.01	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. #17	12.16	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. #20	9.59	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. "B"	9.66	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. "E"	14.76	203	19	4-21-53	STANDARD H&N DISC IN CONC.	
	P.I. "F"	15.92	203	19	4-21-53	USN DISC IN TRUNCATED CONC PYRAMID	
	ENIWETOK	11.05	LIST OF VALID BENCHES			CONC. MON.	
	USC & GS #3	10.90	LIST OF VALID BANCHES			NAVY MON. NR. BLDG. #1	
	PANSY	10.40	LIST OF VALID BENCHES			USC & GS DISC IN CONC. MON.	
	VIOLET	12.25	LIST OF VALID BENCHES			STANDARD H&N DISC IN CONC.	
	ROSE	11.61	LIST OF VALID BENCHES			STANDARD H&N DISC IN CONC.	

NOTE: STANDARD H&N DISC IN CONCRETE IS A 2 5/8" DIA BRASS DISC SET IN A CONCRETE MONUMENT FROM 6 TO 8 INCHES BELOW GROUND ELEVATION, WITH NAME OR NUMBER DESIGNATION STAMPED ON ITS FACE.

REFERENCE TO "LIST OF VALID BENCHES" REFERS TO LIST ASSEMBLED, ADJUSTED AND REPRODUCED FROM VARIOUS LEVEL CIRCUITS ON SITE FRED.

BENCH MARKS

SITE	STATION	ELEV	FIELD BOOK	PAGE	DATE	DESCRIPTION	REMARKS
KATE	MUZIN	6.40	28	27	3-30-50	CONC. MON.	TIDE OBSERVATIONS
	P.I. "A"	8.72	141	28	6-31-51	STANDARD H&N DISC. IN CONC.	CLOSED CIRCUIT FROM MUZIN
LUCY	BEACON "M"	8.60	37	7	4-12-50	USN CONC. MON	TIDE OBSERVATIONS
	R.P. "A"	6.71	142	5	6-15-51	STANDARD H&N DISC IN CONC.	CLOSED CIRCUIT FROM BN "M"
	R.P. "B"	7.09	142	5	6-15-51	STANDARD H&N DISC IN CONC.	CLOSED CIRCUIT FROM BN. "M"
MARY	BOKON	10.40	31	6	3-27-50	CONC. MON.	TIDE OBSERVATIONS
	MATT	9.53	159	10	4-3-52	CONC. MON.	CLOSED CIRCUIT FROM BOKON
	ROOK	10.04	215	18	12-22-53	CONC. MON.	CLOSED CIRCUIT FROM BOKON
NANCY	NICK	10.54	159	10	4-3-52	CONC. MON.	CIRCUIT BOKON TO RUJURO
	YEIRI	9.96	159	10	4-3-52	CONC. MON.	CIRCUIT BOKON TO RUJURO
	JON	10.955	207	25	11-14-53	ALUM. BOLT IN CONC. MON.	CIRCUIT FROM YIERI
OLIVE	OMAR	11.57	159	21	4-3-52	CONC. MON.	CIRCUIT BOKON TO RUJURO
	AITSU	10.05	159	21	4-3-52	CONC. MON.	CIRCUIT BOKON TO RUJURO
	EATON	13.51	207	22	11-13-53	CONC. MON.	CLOSED CIRCUIT FROM AITSU
	EVY	9.29	207	22	11-13-53	Bolt in Conc Mon.	CLOSED CIRCUIT FROM AITSU
PEARL	PAUL	9.73	159	8	4-7-52	CONC. MON.	CIRCUIT BOKON TO RUJURO
	RUJURO	10.90	159	9	3-21-52	CONC. MON.	CLOSED CIRCUIT FROM BOKON
	TENT POLE "J"	9.33	207	24	11-14-53	CONC. MON.	CLOSED CIRCUIT FROM RUJURO
	TENT POLE "K"	13.88	207	24	11-14-53	CONC. MON.	CLOSED CIRCUIT FROM RUJURO
	TENT POLE "L"	11.62	207	24	11-14-53	CONC. MON.	CLOSED CIRCUIT FROM RUJURO
RUBY	RUBY	8.837	212	26	11-7-53	STANDARD H&N DISC IN CONC.	
SALLY	AOMON	8.41	202	11	5-12-53	U.S.C. & G.S. BRASS DISC IN CONC.	DISTURBED ABOUT 5-1-53
	DUKE	6.10	202	12	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
	DAN	12.40	202	12	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
TILDA	JACK	7.18	202	11	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
	JEAN	8.78	202	11	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
	IOWA	7.95	202	11	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
URSULA	KATE	8.66	202	11	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
	R.P. KATE	8.33	202	11	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
	UTAH	8.34	202	11	5-12-53	STANDARD H&N DISC IN CONC.	CIRCUIT SALLY-URSULA
	LUKE	10.94	207	20	11-11-53	6" CENTER PUNCHED BOLT IN CONC.	CLOSED CIRCUIT FROM KATE
VERA *	LUCY	8.44	33	2	12-( )-50	STANDARD H&N DISC. IN CONC.	TIDE OBSERVATIONS
	BEACON "K"	12.22	33	2	12-( )-50	USN DISC IN CONC.	CLOSED CIRCUIT FROM LUCY
WILMA	PIIRAAI	8.80	24	22	1-20-50	CONC. MON.	TIDE OBSERVATIONS
	STA. 60	9.88	124	18	3-9-51	✓ CHISELED IN SE FTG OF NE TOWER	CLOSED CIRCUIT FROM PIRAAI
	STA. 62	9.55	124	18	3-19-51	✓ CHISELED IN SE FTG SW	CLOSED CIRCUIT FROM PIRAAI
YVONNE	#59	4.26	104	16	5-23-51	NOT AVAILABLE	C.C. FROM TRAVERSE RUNIT
	USC&GS NO BASE	6.60	104	16	5-23-51	U.S.C. & G.S. CONC. MON.	CC. FROM TRAVERSE RUNIT
	#26 (L&T)	23.40	104	16	5-23-51	NOT AVAILABLE	C.C. FROM TRAVERSE RUNIT
VERA *	BABE	13.32	217	7	12-22-53	CLOSED CIRCUIT FROM LUCY (STA)	CONCRETE MONUMENT SET 1953

BENCH MARKS

SITE	STATION	ELEV	FIELD BOOK	PAGE	DATE	DESCRIPTION	REMARKS
YVONNE	TRAVERSE RUNIT	12.95	5	2	3-16-49	U.S.C. & G.S. MON.	TIDE OBSERVATIONS
	SOUTH BASE	8.33	134	15	6-16-51	U.S.C. & G.S. MON.	C.C. FROM TRAVERSE RUNIT ALSO CALLED RUNIT
ZONA	TOWER FTGS	6.67	73	20	11-29-50	NOT AVAILABLE	C.C. FROM RUNIT
	WINCH BASE	6.64	73	20	11-29-50	NOT AVAILABLE	C.C. FROM RUNIT
ALVIN							
BRUCE	ANIYAANII	9.60	165	14	4-17-52		TIDE OBSERVATIONS
	BESS	8.70	165	18	4-19-52		C.C FROM ANIYAANII
	BYRL	9.07			4-19-52		C.C. FROM ANIYAANII
CLYDE							
DAVID	PIER	9.00	85	12	12-9-50	PILE CUTOFF - BASE OF PIER	FROM M.H. INVERT GRADES
	BLDG. 48	10.17	32	3	3-14-50	BOOSTER PUMP STATION	NO SOURCE GIVEN
ELMER	ASH	9.86	F.S. 578			STANDARD H&N DISC IN CONC.	
	PARRY	8.63	F.S.578			STANDARD H&N DISC IN CONC.	
	MAGNETIC	[illegible]	F.S.578			STANDARD H&N DISC IN CONC.	
	"H"	13.24	F.S. 578			STANDARD H&N DISC IN CONC.	
	"L"	11.07	F.S.578			STANDARD H&N DISC IN CONC.	
	"M"	17.97	F.S.578			STANDARD H&N DISC IN CONC.	
	P.I. #25	10.84	F.S.578			STANDARD H&N DISC IN CONC.	
	P.I. #26	9.77	F.S.578			STANDARD H&N DISC IN CONC.	
FRED	ENIWET "A"	15.03	LIST OF	VALID	BENCHES	USC & GS MON. 220' N OF NE COR.	AIRSTRIP
	ENIWET "B"	10.83	LIST OF	VALID	BENCHES	USC & GS MON. NO. BLDG. 117A & B	
	ENIWET "C"	13.85	LIST OF	VALID	BENCHES	USC & GS MON. ACCR. RD FR BLDG 61	
	B.M. #4	12.02	LIST OF	VALID	BENCHES	CONC. MON. 93' SW USC & GS #2	
	B.M. #6	10.27	LIST OF	VALID	BENCHES	CONC. MON. NO. SIDE CHAPEL	
	B.M. #7	11.65	LIST OF	VALID	BENCHES	CONC. PYRAMID ACROSS FR WOODS FIELD	STAMPED H&N TULIP
	B.M. 53-A	10.87	LIST OF	VALID	BENCHES	N.W. COR. SLAB BLDG. #7	
	B.M. 53-B	11.17	LIST OF	VALID	BENCHES	N.E. COR. DOOR SLAB BLDG. #15	
	B.M. 53-C	12.33	LIST OF	VALID	BENCHES	N.E. COR. SLAB BLDG. #50	
	B.M. 53-D	13.82	LIST OF	VALID	BENCHES	TOP FIRE HYD. OPP. WHSE #37	
	B.M. 53-F	11.32	LIST OF	VALID	BENCHES	S.W. COR. CENTER SLAB BLDG. #56	
	B.M. 53-H	19.84	LIST OF	VALID	BENCHES	TOP FIRE HYD. #16 OPP. BLDG #160	
	B.M. 53-I	17.21	LIST OF	VALID	BENCHES	TOP FIRE HYD. #17 83' N. OPP. BLDG. #156	
LEROY	RIGILI	9.11	159	4	2-21-52	50 Cal shell in Conc Mon	Tide Observations

ENGINEERING CALCULATION SHEET

HOLMES & NARVER, INC.
ENGINEERS - CONSTRUCTORS

JOB NO. 942
SHEET 1 OF
BY ES DATE

TITLE HEIGHT OF TIDE AT ANY TIME

Obtain from the predictions the high water and low water, one of which is before and the other after the time for which the height is required. The difference between the times of occurrence of these tides is the duration of rise or fall, and the difference between their heights is the range of tide. Find the difference between the time of the nearest high or low and the time for which the height is required. (Cont'd at bottom of page)

DURATION OF RISE OR FALL h m	TIME FROM NEAREST HIGH OR LOW WATER														
4 00	0 05	0 16	0 24	0 32	0 40	0 48	0 56	1 04	1 12	1 20	1 28	1 36	1 44	1 52	2 00
4 20	0 09	0 17	0 26	0 35	0 43	0 52	1 01	1 09	1 18	1 27	1 35	1 44	1 53	2 01	2 10
4 30	0 09	0 19	0 28	0 37	0 47	0 56	1 05	1 15	1 24	1 33	1 43	1 52	2 01	2 11	2 20
5 00	0 10	0 20	0 30	0 40	0 50	1 00	1 10	1 20	1 30	1 40	1 50	2 00	2 10	2 20	2 30
5 20	0 11	0 21	0 32	0 43	0 53	1 04	1 15	1 25	1 36	1 47	1 57	2 08	2 19	2 29	2 40
5 40	0 11	0 23	0 34	0 45	0 57	1 08	1 19	1 31	1 42	1 53	2 05	2 16	2 27	2 39	2 50
6 00	0 12	0 24	0 36	0 48	1 00	1 12	1 24	1 36	1 48	2 00	2 12	2 24	2 36	2 48	3 00
6 20	0 13	0 25	0 38	0 51	1 03	1 16	1 29	1 41	1 54	2 07	2 19	2 32	2 45	2 57	3 10
6 40	0 13	0 27	0 40	0 53	1 07	1 20	1 33	1 47	2 00	2 13	2 27	2 40	2 53	3 07	3 20
7 00	0 14	0 28	0 42	0 56	1 10	1 24	1 38	1 52	2 06	2 20	2 34	2 48	3 02	3 16	3 30
7 20	0 15	0 29	0 44	0 59	1 13	1 28	1 43	1 57	2 12	2 27	2 41	2 56	3 11	3 25	3 40
7 40	0 15	0 31	0 46	1 01	1 17	1 32	1 47	2 03	2 18	2 33	2 49	3 04	3 19	3 35	3 50
8 00	0 16	0 32	0 48	1 04	1 20	1 36	1 52	2 08	2 24	2 40	2 56	3 12	3 28	3 44	4 00
8 20	0 17	0 33	0 50	1 07	1 23	1 40	1 57	2 13	2 30	2 47	3 03	3 20	3 37	3 53	4 10
8 40	0 17	0 35	0 52	1 09	1 27	1 44	2 01	2 19	2 36	2 53	3 11	3 28	3 45	4 03	4 20
9 00	0 18	0 36	0 54	1 12	1 30	1 48	2 06	2 24	2 42	3 00	3 18	3 36	3 54	4 12	4 30

RANGE OF TIDE ft	CORRECTION TO HEIGHT														
0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
1.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5
1.5	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8
2.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
2.5	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2
3.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.2	1.3	1.5
3.5	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.9	1.0	1.2	1.4	1.6	1.8
4.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.6	1.8	2.0
4.5	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6	1.8	2.0	2.2
5.0	0.0	0.1	0.1	0.2	0.3	0.5	0.6	0.8	1.0	1.2	1.5	1.7	2.0	2.2	2.5
5.5	0.0	0.1	0.1	0.2	0.4	0.5	0.7	0.9	1.1	1.4	1.6	1.9	2.2	2.5	2.8
6.0	0.0	0.1	0.1	0.3	0.4	0.6	0.8	1.0	1.2	1.5	1.8	2.1	2.4	2.7	3.0
6.5	0.0	0.1	0.2	0.3	0.4	0.6	0.8	1.1	1.3	1.6	1.9	2.2	2.6	2.9	3.2
7.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.2	1.4	1.8	2.1	2.4	2.8	3.1	3.5

Enter the table with the duration of rise or fall, which most nearly agrees with the actual value, and on that horizontal line find the time from the nearest high or low water which agrees most nearly with the corresponding actual diff. The correction sought is in the

TIDE TABLES

ENIWETOK ATOLL, MARSHALL ISLANDS

1957

This tabulation is extracted from "Tide Tables, Central and Western Pacific Ocean and Indian Ocean, 1957", and published by the U.S. Department of Commerce, Coast and Geodetic Survey.

Datum, elevation 0.0, is defined in the above publication as follows: "Heights are reckoned from the datum of soundings on the largest scale charts of the locality which is ½ foot below mean low water springs" for Kwajalein Atoll, Marshall Islands.

The reference station is Kwajalein Atoll, time meridian 180 degrees east. The following tabulation appears in Table 2. - Tidal Differences and ranges:

				Ranges	
	Lat	Long.	Time	Mean	Spring
Eniwetok Atoll	11° 21'	162° 21'	-05 min.	2.7'	3.9'

Range is the difference between successive tides, i.e., between a high and a low or a low and a high. Mean range is the average range of all tides in the year. Spring range is the average of the largest ranges in the year. Springs occur once each lunar month (approximately 28 days) when the highest highs and the lowest lows are recorded.

The values in this tabulation are based on average weather conditions. Unusual weather, particularly high winds from a direction other than seasonally normal, affect both the times and the heights.

Each site in the Atoll has a slightly different time and height of highs and lows. This can be disregarded for all practical purposes in the lagoon. The water level on the ocean reef is always higher than that of the lagoon, the difference varying from a few tenths to 1.5'.

COMPILED BY:
HOLMES & NARVER, INC.,
ENGINEERS-CONSTRUCTORS
SURVEY DEPARTMENT
ENGINEERING DIVISION
SITE ELMER

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR JANUARY 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1 Tu	0416	H 3.7	9 W	0236	L 1.5	17 Th	0450	H 4.2	25 F	0519	L 1.9
	1007	L 0.9		0902	H 3.3		1046	L 0.4		1230	H 3.3
	1628	H 4.6		1503	L 1.9		1705	H 5.1		1935	L 2.0
	2255	L 0.8		2103	H 3.2		2329	L 0.2		----	- ---
2 W	0448	H 3.8	10 Th	0336	L 1.7	18 F	0528	H 4.3	26 Sa	0117	H 2.8
	1039	L 0.8		1023	H 3.2		1126	L 0.4		0704	L 1.9
	1658	H 4.6		1650	L 2.1		1744	H 5.0		1350	H 3.5
	2324	L 0.7		2235	H 2.9		----	- ---		2037	L 1.7
3 Th	0519	H 3.8	11 F	0506	L 1.3	19 Sa	0006	L 0.3	27 Su	0226	H 3.0
	1111	L 0.8		1202	H 3.4		0607	H 4.2		0808	L 1.7
	1728	H 4.6		1946	L 1.9		1206	L 0.5		1439	H 3.8
	2353	L 0.7		---	- ---		1822	H 4.8		2115	L 1.4
4 F	0550	H 3.8	12 Sa	0030	H 2.9	20 Su	0043	L 0.5	28 M	0306	H 3.2
	1141	L 0.9		0637	L 1.7		0646	H 4.2		0851	L 1.4
	1758	H 4.5		1320	H 3.7		1247	L 0.8		1515	H 4.2
	----	- ---		1959	L 1.5		1900	H 4.4		2145	L 1.1
5 Sa	0022	L 0.8	13 Su	0149	H 3.2	21 M	0119	L 0.8	29 Tu	0339	H 3.5
	0621	H 3.8		0744	L 1.4		0727	H 3.9		0927	L 1.2
	1212	L 1.1		1416	H 4.1		1329	L 1.2		1546	H 4.4
	1827	H 4.3		2050	L 1.2		1939	H 4.0		2212	L 0.8
6 Su	0051	L 0.9	14 M	0244	H 3.5	22 Tu	0158	L 1.2	30 W	0407	H 3.8
	0652	H 3.2		0837	L 1.1		0812	H 3.7		1001	L 1.0
	1244	L 1.2		1502	H 4.5		1418	L 1.5		1616	H 4.5
	1857	H 4.1		2133	L 0.8		2022	H 3.5		2239	L 0.7
7 M	0121	L 1.1	15 Tu	0329	H 3.8	23 W	0241	L 1.5	31 Th	0436	H 3.9
	0727	H 3.5		0923	L 0.8		0908	H 3.5		1030	L 0.8
	1319	L 1.5		1544	H 4.8		1523	L 1.9		1644	H 4.6
	1929	H 3.8		2213	L 0.5		2217	H 3.1		2305	L 0.6
8 Tu	0155	L 1.3	16 W	0410	H 4.0	24 Th	0339	L 1.8			
	0807	H 3.4		1005	L 0.5		1032	H 3.2			
	1402	L 1.7		1625	H 5.0		1726	L 2.2			
	2007	H 3.5		2251	L 0.2		2300	H 2.8			

DAY	SUNRISE	SUNSET
1	0731	1853
11	0734	1904
21	0735	1910
31	0736	1914

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR FEBRUARY 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0504	H 4.1	9	0345	L 1.8	17	0548	H 4.6	25	0226	H 2.9
F	1059	L 0.8	Sa	1054	H 3.4	Su	1154	L 0.4	M	0800	L 1.9
	1732	H 4.6		1705	L 2.1		1804	H 4.8		1424	H 3.7
	2331	L 0.6		2350	H 3.8		----	-----		2100	L 1.5
2	0531	H 4.2	10	----	-----	18	0016	L 0.5	26	0257	H 3.3
Sa	1123	L 0.8	Su	0555	L 1.9	M	0623	H 4.5	Tu	0844	L 1.6
	1738	H 4.6		1249	H 3.6		1231	L 0.6		1459	H 4.0
	2356	L 0.6		1945	L 1.7		1858	H 4.4		2125	L 1.2
3	0558	H 4.2	11	0139	H 3.1	19	0048	L 0.8	27	0325	H 3.6
Su	1156	L 0.8	M	0729	L 1.6	Tu	0658	H 4.3	W	0917	L 1.3
	1805	H 4.5		1400	H 4.0		1308	L 1.0		1529	H 4.2
	----	-----		2039	L 1.2		1911	H 4.0		2150	L 1.0
4	0021	L 0.8	12	0237	H 3.5	20	0119	L 1.1	28	0350	H 3.9
M	0626	H 4.1	Tu	0829	L 1.2	W	0735	H 4.0	Th	0947	L 1.1
	1225	L 1.0		1451	H 4.5		1348	L 1.5		1557	H 4.5
	1831	H 4.2		2121	L 0.8		1944	H 3.5		2214	L 0.8
5	0047	L 0.9	13	0320	H 3.8	21	0151	L 1.5			
Tu	0654	H 4.0	W	0916	L 0.8	Th	0816	H 3.7			
	1256	L 1.2		1534	H 4.8		1439	L 1.8			
	1859	H 3.9		2159	L 0.5		2021	H 3.1			
6	0114	L 1.1	14	0359	H 4.2	22	0228	L 1.8			
W	0727	H 3.8	Th	0959	L 0.5	F	0917	H 3.3			
	1331	L 1.5		1614	H 5.0		1616	L 2.2			
	1931	H 3.6		2236	L 0.3		2133	H 2.6			
7	0146	L 1.3	15	0436	H 4.5	23	0343	L 2.2			
Th	0802	H 3.6	F	1038	L 0.3	Sa	1131	H 3.2			
	1419	L 1.8		1652	H 5.2		1929	L 2.2			
	2013	H 3.2		2310	L 0.2		----	-----			
8	0229	L 1.6	16	0512	H 4.6	24	0116	H 2.6			
F	0909	H 3.5	Sa	1116	L 0.3	Su	0643	L 2.2			
	1538	L 2.0		1723	H 5.0		1331	H 3.4			
	2124	H 2.9		2344	L 0.2		2029	L 1.8			

DAY	SUNRISE	SUNSET
5	0735	1915
15	0733	1918
25	0728	1920

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR MARCH 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1 F	0417	H 4.2	9 Sa	0151	L 1.6	17 Su	0451	H 4.9	25 M	0046	H 2.7
	1015	L 0.8		0829	H 3.7		1102	L 0.3		0602	L 2.5
	1623	H 4.6		1507	L 2.0		1708	H 4.8		1244	H 3.3
	2238	L 0.6		2055	H 2.9		2317	L 0.4		1950	L 1.9
2 Sa	0441	H 4.3	10 Su	0259	L 1.9	18 M	0525	H 4.9	26 Tu	0202	H 3.0
	1042	L 0.8		1005	H 3.5		1137	L 0.4		0738	L 2.2
	1649	H 4.6		1733	L 2.1		1742	H 4.6		1350	H 3.5
	2302	L 0.6		2330	H 2.8		2347	L 0.5		2025	L 1.6
3 Su	0506	H 4.5	11 M	0526	L 2.1	19 Tu	0558	H 4.8	27 W	0233	H 3.4
	1109	L 0.7		1220	H 3.6		1213	L 0.7		0823	L 1.8
	1715	H 4.6		1923	L 1.8		1814	H 4.3		1429	H 3.8
	2326	L 0.6		----	-----		----	----		2051	L 1.4
4 M	0531	H 4.5	12 Tu	0127	H 3.2	20 W	0017	L 0.8	28 Th	0258	H 3.8
	1137	L 0.7		0717	L 1.8		0631	H 4.5		0856	L 1.5
	1741	H 4.5		1341	H 3.9		1248	L 1.0		1500	H 4.1
	2350	L 0.7		2018	L 1.3		1845	H 3.9		2116	L 1.1
5 Tu	0557	H 4.5	13 W	0221	H 3.6	21 Th	0045	L 1.2	29 F	0323	H 4.1
	1205	L 0.8		0818	L 1.3		0705	H 4.2		0925	L 1.2
	1807	H 4.2		1445	H 4.4		1325	L 1.4		1528	H 4.3
	----	-----		2059	L 0.9		1916	H 3.5		2140	L 0.9
6 W	0014	L 0.8	14 Th	0303	H 4.1	22 F	0113	L 1.5	30 Sa	0348	H 4.3
	0625	H 4.4		0904	L 0.8		0740	H 3.8		0953	L 0.9
	1236	L 1.0		1518	H 4.7		1409	L 1.8		1555	H 4.5
	1835	H 4.0		2137	L 0.5		1951	H 3.1		2205	L 0.8
7 Th	0041	L 1.0	15 F	0341	H 4.5	23 Sa	0143	L 1.9	31 Su	0413	H 4.5
	0657	H 4.2		0946	L 0.5		0827	H 3.5		1021	L 0.8
	1311	L 1.3		1557	H 4.9		1524	L 2.2		1623	H 4.5
	1907	H 3.7		2211	L 0.4		2047	H 2.7		2229	L 0.7
8 F	0111	L 1.3	16 Sa	0416	H 4.3	24 Su	0236	L 2.2			
	0735	H 4.0		1025	L 0.3		1007	H 3.2			
	1356	L 1.6		1635	H 5.0		1830	L 2.2			
	1948	H 3.3		2245	L 0.3		----	-----			

DAY	SUNRISE	SUNSET
2	0726	1921
12	0720	1922
22	0714	1922

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR APRIL 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1 M	0439	H 4.7	9 Tu	0508	L 2.2	17 W	0535	H 4.9	25 Th	0148	H 3.4
	1049	L 0.7		1147	H 3.6		1156	L 0.8		0746	L 2.0
	1650	H 4.5		1847	L 1.7		1753	H 4.2		1341	H 3.6
	2254	L 0.7		----	---		2350	L 0.9		2003	L 1.5
2 Tu	0505	H 4.8	10 W	0059	H 3.3	18 Th	0608	H 4.7	26 F	0220	H 3.8
	1118	L 0.7		0657	L 1.8		1231	L 1.1		0824	L 1.7
	1718	H 4.4		1313	H 3.8		1825	H 3.8		1420	H 3.8
	2321	L 0.8		1947	L 1.4		----	-----		2033	L 1.3
3 W	0533	H 4.8	11 Th	0157	H 3.8	19 F	0019	L 1.2	27 Sa	0248	H 4.1
	1149	L 0.8		0801	L 1.4		0641	H 4.4		0857	L 1.4
	1748	H 4.2		1410	H 4.2		1309	L 1.4		1454	H 4.0
	2348	L 0.8		2030	L 1.0		1859	H 3.5		2101	L 1.1
4 Th	0603	H 4.7	12 F	0240	H 4.2	20 Sa	0049	L 1.5	28 Su	0316	H 4.4
	1222	L 1.0		0843	L 1.0		0717	H 4.1		0928	L 1.1
	1819	H 3.9		1455	H 4.5		1352	L 1.7		1526	H 4.2
	----	-----		2106	L 0.8		1939	H 3.2		2129	L 0.9
5 F	0017	L 1.1	13 Sa	0313	H 4.6	21 Su	0123	L 1.9	29 M	0343	H 4.6
	0637	H 4.5		0929	L 0.7		0800	H 3.7		0959	L 0.9
	1301	L 1.2		1535	H 4.6		1453	L 2.0		1557	H 4.2
	1855	H 3.7		2144	L 0.6		2042	H 2.6		2158	L 0.8
6 Sa	0050	L 1.4	14 Su	0354	H 4.9	22 M	0216	L 2.2	30 Tu	0412	H 4.8
	0717	H 4.2		1009	L 0.5		0908	H 3.4		1030	L 0.8
	1348	L 1.5		1612	H 4.6		1646	L 2.2		1628	H 4.2
	1940	H 3.3		2216	L 0.5		2319	H 2.8		2226	L 0.8
7 Su	0134	L 1.7	15 M	0428	H 5.0	23 Tu	0343	L 2.5			
	0812	H 3.8		1046	L 0.5		1112	H 3.2			
	1501	L 1.8		1647	H 4.5		1733	L 2.0			
	2055	H 3.9		2249	L 0.5		----	-----			
8 M	0246	L 2.0	16 Tu	0502	H 5.1	24 W	0512	H 3.1			
	0943	H 3.6		1122	L 0.5		0759	L 2.3			
	1704	L 1.9		1721	H 4.4		1243	H 3.4			
	2315	H 3.9		2325	L 0.7		1927	L 1.5			

DAY	SUNRISE	SUNSET
1	0706	1902
11	0702	1922
21	0656	1943

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR MAY 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0443	H 4.9	9	0022	H 3.5	17	0550	H 4.7	25	0129	H 3.7
W	1103	L 0.8	Th	0629	L 1.8	F	1219	L 1.1	Sa	0744	L 1.8
	1700	H 4.2		1230	H 3.7		1812	H 3.7		1331	H 3.5
	2257	L 0.8		1907	L 1.5		----	-----		1943	L 1.5
2	0514	H 4.9	10	0126	H 3.8	18	0001	L 1.2	26	0208	H 4.0
Th	1136	L 0.8	F	0738	L 1.5	Sa	0625	H 4.5	Su	0825	L 1.5
	1734	H 4.1		1341	H 3.9		1256	L 1.3		1417	H 3.7
	2329	L 0.9		1956	L 1.2		1849	H 3.5		2021	L 1.3
3	0549	H 4.8	11	0213	H 4.2	19	0035	L 1.5	27	0243	H 4.3
F	1216	L 0.9	Sa	0829	L 1.2	Su	0700	H 4.2	M	0904	L 1.2
	1811	H 3.8		1431	H 4.1		1336	L 1.5		1456	H 3.8
	----	-----		2037	L 1.0		1931	H 3.3		2056	L 1.1
4	0004	L 1.2	12	0255	H 4.6	20	0113	L 1.8	28	0317	H 4.6
Sa	0627	H 4.6	Su	0914	L 0.9	M	0739	H 3.8	Tu	0940	L 1.0
	1259	L 1.2		1513	H 4.2		1424	L 1.8		1533	H 3.9
	1843	H 3.6		2115	L 0.8		2027	H 3.1		2130	L 0.9
5	0044	L 1.4	13	0333	H 4.8	21	0203	L 2.1	29	0350	H 4.8
Su	0712	H 4.3	M	0954	L 0.8	Tu	0830	H 3.5	W	1016	L 0.8
	1350	L 1.4		1551	H 4.2		1529	L 1.9		1611	H 4.0
	1946	H 3.4		2150	L 0.8		2149	H 3.0		2205	L 0.8
6	0134	L 1.7	14	0409	H 5.0	22	0325	L 2.3	30	0426	H 4.9
M	0803	H 4.0	Tu	1031	L 0.7	W	0944	H 3.3	Th	1053	L 0.8
	1457	L 1.7		1627	H 4.2		1651	L 1.9		1648	H 4.1
	2102	H 3.2		2224	L 0.8		2329	H 3.1		2242	L 0.8
7	0250	L 2.0	15	0443	H 5.0	23	0523	L 2.4	31	0503	H 5.0
Tu	0927	H 3.8	W	1100	L 0.8	Th	1117	H 3.2	F	1132	L 0.8
	1629	L 1.8		1702	H 4.1		1806	L 1.8		1727	H 4.0
	2247	H 3.2		2256	L 0.8		----	----		2318	L 0.9
8	0444	L 2.1	16	0517	H 4.9	24	0042	H 3.4			
W	1109	H 3.6	Th	1143	L 0.8	F	0649	L 2.2			
	1801	L 1.7		1736	H 3.9		1236	H 3.4			
	----	-----		2320	L 1.1		1902	L 1.7			

DAY	SUNRISE	SUNSET
1	0652	1925
11	0649	1926
21	0647	1928
31	0646	1931

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR JUNE 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1 Sa	0542	H 4.9	9 Su	0148	H 4.1	17 M	0023	L 1.4	25 Tu	0214	H 4.2
	1212	L 0.8		0813	L 1.5		0642	H 4.3		0843	L 1.4
	1808	H 3.8		1408	H 3.6		1313	L 1.2		1434	H 3.5
	----	-----		2009	L 1.3		1913	H 3.5		2028	L 1.2
2 Su	0000	L 1.1	10 M	0235	H 4.4	18 Tu	0059	L 1.6	26 W	0256	H 4.5
	0623	H 4.8		0902	L 1.2		0716	H 4.0		0925	L 1.1
	1256	L 1.0		1456	H 3.8		1351	L 1.4		1519	H 3.8
	1853	H 3.8		2051	L 1.2		1956	H 3.4		2111	L 1.1
3 M	0044	L 1.2	11 Tu	0315	H 4.6	19 W	0141	L 1.8	27 Th	0335	H 4.8
	0709	H 4.5		0944	L 1.0		0755	H 3.8		1005	L 0.8
	1345	L 1.2		1536	H 3.8		1432	L 1.6		1559	H 3.9
	1946	H 3.5		2129	L 1.0		2047	H 3.3		2152	L 0.8
4 Tu	0136	L 1.5	12 W	0353	H 4.8	20 Th	0234	L 2.1	28 F	0415	H 4.9
	0800	H 4.2		1022	L 0.9		0842	H 3.5		1045	L 0.7
	1441	L 1.4		1614	H 3.8		1525	L 1.8		1640	H 4.1
	2049	H 3.5		2206	L 1.0		2154	H 3.2		2234	L 0.8
5 W	0242	L 1.8	13 Th	0428	H 4.8	21 F	0350	L 2.2	29 Sa	0455	H 5.1
	0905	H 3.8		1057	L 0.8		0946	H 3.2		1123	L 0.6
	1550	L 1.5		1649	H 3.8		1632	L 1.8		1720	H 4.1
	2209	H 3.4		2240	L 1.0		2314	H 3.3		2314	L 0.8
6 Th	0413	L 1.9	14 F	0502	H 4.8	22 Sa	0530	L 2.2	30 Su	0535	H 5.0
	1026	H 3.5		1132	L 0.9		1114	H 3.2		1203	L 0.6
	1708	L 1.6		1724	H 3.8		1746	L 1.8		1802	H 4.1
	2337	H 3.5		2315	L 1.1		----	-----		2356	L 0.8
7 F	0554	L 1.9	15 Sa	0536	H 4.7	23 Su	0029	H 3.5			
	1155	H 3.5		1205	L 1.0		0656	L 2.0			
	1822	L 1.5		1759	H 3.8		1238	H 3.2			
	----	----		2349	L 1.2		1851	L 1.7			
8 Sa	0051	H 3.8	16 Su	0609	H 4.5	24 M	0127	H 3.8			
	0714	L 1.7		1238	L 1.1		0755	L 1.7			
	1310	H 3.5		1835	H 3.6		1343	H 3.3			
	1921	L 1.5		----	-----		1943	L 1.5			

DAY	SUNRISE	SUNSET
5	0646	1933
15	0647	1936
25	0649	1938

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR JULY 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0616	H 4.8	9	0222	H 4.2	17	0039	L 1.3	25	0240	H 4.4
M	1243	L 0.7	Tu	0857	L 1.4	W	0649	H 4.2	Th	0912	L 1.1
	1845	H 4.0		1448	H 3.4		1312	L 1.2		1508	H 3.7
	----	-----		2037	L 1.4		1919	H 3.8		2100	L 1.1
2	0040	L 1.0	10	0305	H 4.4	18	0113	L 1.5	26	0323	H 4.8
Tu	0659	H 4.6	W	0937	L 1.2	Th	0719	H 3.9	F	0952	L 0.8
	1326	L 0.9		1529	H 3.6		1343	L 1.4		1549	H 4.0
	1930	H 3.8		2118	L 1.2		1955	H 3.6		2144	L 0.8
3	0128	L 1.2	11	0342	H 4.5	19	0152	L 1.8	27	0404	H 5.0
W	0745	H 4.2	Th	1012	L 1.0	F	0755	H 3.6	Sa	1031	L 0.5
	1412	L 1.2		1605	H 3.8		1420	L 1.5		1628	H 4.2
	2022	H 3.7		2155	L 1.1		2042	H 3.5		2225	L 0.6
4	0224	L 1.5	12	0416	H 4.7	20	0244	L 2.0	28	0443	H 5.1
Th	0836	H 3.8	F	1045	L 0.9	Sa	0839	H 3.3	Su	1108	L 0.4
	1505	L 1.5		1637	H 3.8		1508	L 1.8		1707	H 4.4
	2126	H 3.6		2230	L 1.0		2147	H 3.4		2306	L 0.5
5	0336	L 1.8	13	0448	H 4.8	21	0406	L 2.2	29	0523	H 5.1
F	0941	H 3.5	Sa	1115	L 0.8	Su	0951	H 3.1	M	1145	L 0.4
	1611	L 1.7		1709	H 3.9		1622	L 1.9		1746	H 4.5
	2247	H 3.5		2303	L 1.0		2319	H 3.4		2347	L 0.5
6	0515	L 2.0	14	0519	H 4.7	22	0604	L 2.2	30	0602	H 4.9
Sa	1107	H 3.2	Su	1144	L 0.8	M	1145	H 2.9	Tu	1221	L 0.5
	1731	L 1.8		1741	H 3.9		1758	L 1.8		1825	H 4.4
	----	-----		2335	L 1.0		----	-----		----	-----
7	0014	H 3.6	15	0550	H 4.6	23	0046	H 3.6	31	0028	L 0.8
Su	0654	L 1.9	M	1213	L 0.9	Tu	0732	L 1.8	W	0641	H 4.6
	1241	H 3.2		1813	H 3.9		1319	H 3.1		1258	L 0.8
	1848	L 1.7		----	-----		1914	L 1.7		1905	H 4.2
8	0127	H 3.8	16	0006	L 1.2	24	0150	H 4.0			
M	0807	L 1.7	Tu	0619	H 4.4	W	0823	L 1.5			
	1355	H 3.2		1242	L 1.0		1420	H 3.4			
	1949	L 1.5		1844	H 3.8		2012	L 1.4			

DAY	SUNRISE	SUNSET
5	0652	1939
15	0655	1939
25	0657	1937

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR AUGUST 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0111	L 1.1	9	0330	H 4.4	17	0118	L 1.5	25	0349	H 5.0
Th	0720	H 4.2	F	0957	L 1.1	Sa	0715	H 3.7	Su	1010	L 0.5
	1337	L 1.1		1552	H 3.8		1329	L 1.4		1612	H 4.5
	1950	H 4.0		2145	L 1.1		1949	H 3.8		2215	L 0.5
2	0158	L 1.4	10	0400	H 4.6	18	0200	L 1.8	26	0428	H 5.2
F	0803	H 3.8	Sa	1024	L 0.8	Su	0753	H 3.4	M	1045	L 0.3
	1419	L 1.4		1621	H 4.0		1407	L 1.7		1648	H 4.8
	2041	H 3.8		2217	L 0.9		2041	H 3.5		2254	L 0.4
3	0258	L 1.8	11	0430	H 4.7	19	0307	L 2.1	27	0505	H 5.1
Sa	0854	H 3.3	Su	1051	L 0.8	M	0852	H 3.0	Tu	1120	L 0.3
	1512	L 1.8		1649	H 4.2		1509	L 1.9		1724	H 4.8
	2151	H 3.5		2247	L 0.8		2210	H 3.4		2332	L 0.4
4	0432	L 2.1	12	0457	H 4.7	20	0518	L 2.2	28	0542	H 4.9
Su	1016	H 2.9	M	1116	L 0.7	Tu	1101	H 2.8	W	1153	L 0.5
	1633	L 2.0		1717	H 4.2		1710	L 2.1		1800	H 4.7
	2337	H 3.5		2316	L 0.8		----	-----		----	-----
5	0645	L 2.1	13	0525	H 4.6	21	0010	H 3.5	29	0010	L 0.6
M	1229	H 2.8	Tu	1141	L 0.8	W	0714	L 1.9	Th	0617	H 4.5
	1824	L 2.0		1744	H 4.2		1308	H 3.0		1227	L 0.8
	----	-----		2345	L 0.9		1858	L 1.8		1837	H 4.5
6	0113	H 3.6	14	0552	H 4.5	22	0131	H 3.9	30	0050	L 0.9
Tu	0808	L 1.8	W	1207	L 0.8	Th	0812	L 1.5	F	0654	H 4.2
	1357	H 3.1		1813	H 4.2		1410	H 3.4		1300	L 1.1
	1942	L 1.8		----	-----		2002	L 1.5		1916	H 4.2
7	0213	H 3.9	15	0014	L 1.1	23	0224	H 4.3	31	0132	L 1.4
W	0854	L 1.5	Th	0618	H 4.3	F	0856	L 1.1	Sa	0730	H 3.7
	1446	H 3.3		1232	L 1.0		1455	H 3.8		1334	L 1.5
	2032	L 1.5		1841	H 4.1		2051	L 1.1		1958	H 3.8
8	0256	H 4.2	16	0044	L 1.3	24	0309	H 4.7			
Th	0927	L 1.2	F	0646	H 4.0	Sa	0934	L 0.7			
	1522	H 3.5		1259	L 1.2		1534	H 4.2			
	2111	L 1.3		1911	H 3.9		2134	L 0.7			

DAY	SUNRISE	SUNSET
4	0659	1935
14	0700	1931
24	0701	1926

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR SEPTEMBER 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0223	L 1.8	9	0406	H 4.6	17	0236	L 2.0	25	0444	H 4.9
Su	0812	H 3.2	M	1020	L 0.8	Tu	0823	H 3.0	W	1052	L 0.4
	1414	L 1.8		1623	H 4.5		1422	L 2.0		1701	H 5.1
	2058	H 3.5		2227	L 0.8		2121	H 3.5		2315	L 0.4
2	0350	L 2.2	10	0432	H 4.6	18	0445	L 2.2	26	0520	H 4.7
M	0925	H 2.8	Tu	1044	L 0.7	W	1043	H 2.8	Th	1124	L 0.5
	1526	L 2.2		1649	H 4.5		1638	L 2.2		1736	H 4.9
	2251	H 3.3		2255	L 0.8		2336	H 3.5		2353	L 0.6
3	0639	L 2.2	11	0458	H 4.5	19	0649	L 1.8	27	0554	H 4.4
Tu	1235	H 2.7	W	1108	L 0.7	Th	1254	H 3.1	F	1157	L 0.8
	1811	L 2.3		1714	H 4.5		1845	L 1.9		1811	H 4.7
	----	-----		2322	L 0.8		----	-----		----	-----
4	0057	H 3.5	12	0524	H 4.5	20	0108	H 3.8	28	0030	L 0.9
W	0800	L 1.8	Th	1132	L 0.8	F	0749	L 1.5	Sa	0628	H 4.0
	1359	H 3.0		1740	H 4.5		1354	H 3.5		1227	L 1.1
	1938	L 2.0		2350	L 0.9		1951	L 1.5		1846	H 4.4
5	0200	H 3.8	13	0550	H 4.2	21	0205	H 4.2	29	0109	L 1.3
Th	0837	L 1.5	F	1156	L 0.9	Sa	0832	L 1.1	Su	0703	H 3.5
	1437	H 3.4		1807	H 4.5		1437	H 4.0		1257	L 1.5
	2025	L 1.7		----	-----		2038	L 1.0		1924	H 4.0
6	0239	H 4.0	14	0019	L 1.1	22	0251	H 4.6	30	0157	L 1.8
F	0906	L 1.3	Sa	0617	H 4.0	Su	0909	L 0.7	M	0742	H 3.2
	1507	H 3.7		1221	L 1.1		1515	H 4.5		1332	L 1.8
	2100	L 1.4		1837	H 4.2		2120	L 0.6		2013	H 3.6
7	0311	H 4.3	15	0053	L 1.4	23	0330	H 4.8			
Sa	0931	L 1.1	Su	0647	H 3.7	M	0944	L 0.5			
	1533	H 4.0		1250	L 1.4		1551	H 4.8			
	2131	L 1.2		1911	H 4.0		2200	L 0.4			
8	0339	H 4.5	16	0134	L 1.6	24	0408	H 4.9			
Su	0956	L 0.8	M	0724	H 3.3	Tu	1019	L 0.3			
	1558	H 4.2		1325	L 1.7		1626	H 5.0			
	2159	L 0.9		1959	H 3.8		2238	L 0.3			

DAY	SUNRISE	SUNSET
3	0701	1920
13	0700	1913
23	0700	1907

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR OCTOBER 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0312	L 2.1	9	0405	H 4.4	17	0413	L 1.9	25	0500	H 4.4
Tu	0851	H 2.8	W	1011	L 0.7	Th	1025	H 2.9	F	1059	L 0.6
	1427	L 2.2		1622	H 4.7		1613	L 2.2		1716	H 5.0
	2148	H 3.3		2233	L 0.8		2259	H 3.5		2338	L 0.6
2	0555	L 2.2	10	0432	H 4.4	18	0609	L 1.8	26	0534	H 4.2
W	1217	H 2.7	Th	1036	L 0.7	F	1226	H 3.2	Sa	1131	L 0.8
	1736	L 2.5		1648	H 4.8		1822	L 1.9		1750	H 4.8
	----	-----		2302	L 0.7		----	-----		----	-----
3	0016	H 3.3	11	0459	H 4.3	19	0038	H 3.7	27	0015	L 0.8
Th	0726	L 1.9	F	1101	L 0.8	Sa	0716	L 1.4	Su	0609	H 3.8
	1342	H 3.1		1714	H 4.8		1329	H 3.7		1203	L 1.1
	1922	L 2.2		2331	L 0.8		1932	L 1.5		1825	H 4.5
4	0130	H 3.5	12	0527	H 4.2	20	0140	H 4.1	28	0054	L 1.2
F	0804	L 1.6	Sa	1127	L 0.9	Su	0802	L 1.1	M	0645	H 3.5
	1415	H 3.4		1743	H 4.6		1413	H 4.2		1234	L 1.5
	2007	L 1.8		----	-----		2022	L 1.1		1901	H 4.1
5	0210	H 3.8	13	0003	L 1.0	21	0228	H 4.3	29	0138	L 1.5
Sa	0832	L 1.4	Su	0557	H 3.9	M	0842	L 0.8	Tu	0726	H 3.2
	1441	H 3.8		1154	L 1.1		1453	H 4.5		1309	L 1.8
	2040	L 1.5		1814	H 4.5		2105	L 0.7		1944	H 3.7
6	0242	H 4.0	14	0038	L 1.2	22	0310	H 4.5	30	0237	L 1.8
Su	0857	L 1.2	M	0631	H 3.6	Tu	0918	L 0.5	W	0828	H 2.8
	1506	H 4.1		1225	L 1.3		1530	H 4.8		1401	L 2.2
	2110	L 1.2		1851	H 4.2		2145	L 0.5		2048	H 3.4
7	0311	H 4.2	15	0122	L 1.5	23	0348	H 4.6	31	0421	L 2.1
M	0922	L 0.9	Tu	0713	H 3.3	W	0953	L 0.5	Th	1042	H 2.8
	1531	H 4.4		1304	L 1.6		1606	H 5.1		1609	L 2.4
	2138	L 1.0		1939	H 3.9		2224	L 0.4		2246	H 3.2
8	0338	H 4.3	16	0226	L 1.8	24	0425	H 4.5			
Tu	0946	L 0.8	W	0817	H 3.0	Th	1027	L 0.5			
	1556	H 4.5		1405	L 2.0		1641	H 5.1			
	2206	L 0.8		2057	H 3.6		2302	L 0.5			

DAY	SUNRISE	SUNSET
3	0700	1906
13	0700	1854
23	0701	1849

ENIWETOK ATOLL, MARSHALL ISLANDS

TIDE TABLE FOR NOVEMBER 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1 F	0614	L 1.9	9 Sa	0442	H 4.1	17 Su	----	-----	25 M	0004	L 0.8
	1245	H 3.0		1038	L 0.8		0633	L 1.5		0557	H 3.7
	1834	L 2.2		1656	H 4.8		1254	H 3.6		1148	L 1.0
	----	-----		2320	L 0.7		1909	L 1.5		1810	H 4.5
2 Sa	0028	H 3.2	10 Su	0514	H 3.9	18 M	0110	H 3.7	26 Tu	0041	L 0.9
	0711	L 1.8		1108	L 0.8		0728	L 1.2		0633	H 3.5
	1333	H 3.3		1728	H 4.8		1348	H 4.1		1222	L 1.3
	1934	L 2.0		2355	L 0.8		2006	L 1.2		1845	H 4.2
3 Su	0126	H 3.5	11 M	0549	H 3.8	19 Tu	0205	H 3.8	27 W	0119	L 1.3
	0748	L 1.5		1141	L 1.0		0813	L 0.9		0713	H 3.2
	1406	H 3.7		1304	H 4.6		1431	H 4.5		1258	L 1.6
	2013	L 1.6		----	-----		2052	L 0.8		1921	H 3.8
4 M	0206	H 3.7	12 Tu	0034	L 1.0	20 W	0251	H 4.0	28 Th	0203	L 1.5
	0818	L 1.2		0627	H 3.6		0854	L 0.8		0801	H 3.1
	1435	H 4.0		1218	L 1.2		1512	H 4.7		1343	L 1.9
	2046	L 1.3		1844	H 4.3		2135	L 0.6		2006	H 3.5
5 Tu	0240	H 3.8	13 W	0120	L 1.2	21 Th	0332	H 4.2	29 F	0259	L 1.7
	0846	L 1.1		0714	H 3.4		0931	L 0.6		0912	H 2.9
	1502	H 4.3		1303	L 1.5		1549	H 4.9		1451	L 2.2
	2116	L 1.1		1932	H 4.0		2214	L 0.5		2108	H 3.2
6 W	0311	H 4.0	14 Th	0218	L 1.5	22 F	0409	H 4.2	30 Sa	0419	L 1.8
	0914	L 0.9		0817	H 3.2		1007	L 0.6		1057	H 2.9
	1530	H 4.5		1405	L 1.8		1625	H 5.0		1653	L 2.3
	2146	L 0.8		2039	H 3.7		2251	L 0.5		2244	H 3.1
7 Th	0341	H 4.1	15 F	0338	L 1.7	23 Sa	0446	H 4.1			
	0941	L 0.8		0952	H 3.1		1041	L 0.7			
	1558	H 4.7		1546	L 2.0		1700	H 4.9			
	2216	L 1.1		2216	H 3.5		2329	L 0.6			
8 F	0411	H 4.1	16 Sa	0516	L 1.6	24 Su	0521	H 3.9			
	1010	L 0.8		1140	H 3.2		1115	L 0.8			
	1627	H 4.8		1748	L 1.9		1735	H 4.8			
	2248	L 0.7		2357	H 3.5		----	-----			

DAY	SUNRISE	SUNSET
2	0704	1845
12	0706	1844
22	0710	1844

ENIWETOK ATOLL, MARSHALL ISLANDS

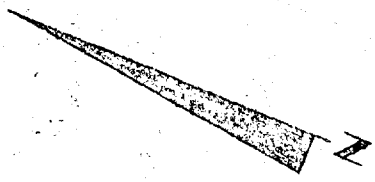
TIDE TABLE FOR DECEMBER 1957

HOLMES & NARVER, INC., ENGINEERS-CONSTRUCTORS

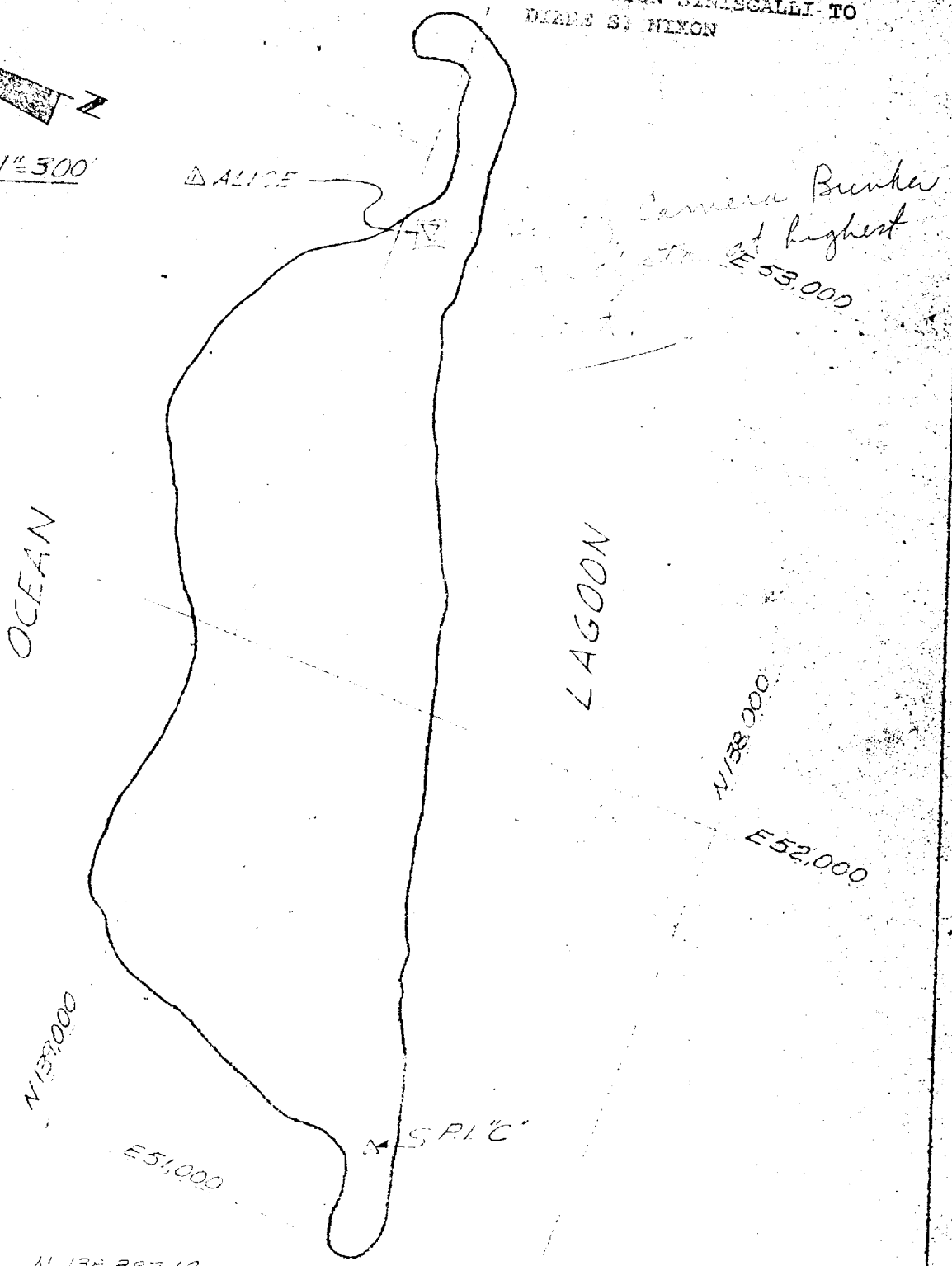
DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0543	L 1.8	9	0508	H 3.9	17	0036	H 3.3	25	0023	L 0.8
Su	1225	H 3.2	M	1101	L 0.8	Tu	0652	L 1.4	W	0619	H 3.7
	1838	L 2.2		1721	H 4.8		1323	H 3.8		1210	L 1.1
	----	-----		2351	L 0.6		1952	L 1.4		1828	H 4.3
2	0016	H 3.1	10	0546	H 3.8	18	0145	H 3.4	26	0055	L 0.9
M	0647	L 1.7	Tu	1138	L 0.8	W	0749	L 1.2	Th	0654	H 3.5
	1319	H 3.5		1759	H 4.7		1416	H 4.2		1245	L 1.3
	1938	L 1.8		----	-----		2045	L 1.1		1859	H 4.1
3	0120	H 3.2	11	0030	L 0.8	19	0238	H 3.5	27	0128	L 1.2
Tu	0732	L 1.5	W	0626	H 3.7	Th	0836	L 1.0	F	0731	H 3.4
	1400	H 3.8		1218	L 1.0		1500	H 4.5		1321	L 1.5
	2020	L 1.5		1839	H 4.5		2129	L 0.8		1932	H 3.8
4	0207	H 3.4	12	0113	L 0.9	20	0322	H 3.7	28	0204	L 1.4
W	0810	L 1.2	Th	0711	H 3.5	F	0917	L 0.8	Sa	0814	H 3.2
	1435	H 4.1		1304	L 1.2		1539	H 4.7		1404	L 1.8
	2057	L 1.2		1926	H 4.2		2209	L 0.7		2010	H 3.4
5	0247	H 3.5	13	0200	L 1.2	21	0401	H 3.8	29	0248	L 1.6
Th	0845	L 1.1	F	0804	H 3.4	Sa	0954	L 0.8	Su	0911	H 3.2
	1507	H 4.4		1359	L 1.5		1615	H 4.8		1505	L 2.1
	2131	L 1.0		2020	H 3.8		2245	L 0.6		2101	H 3.1
6	0322	H 3.7	14	0259	L 1.4	22	0438	H 3.8	30	0348	L 1.8
F	0918	L 0.9	Sa	0914	H 3.3	Su	1030	L 0.8	M	1034	H 3.1
	1539	H 4.6		1514	L 1.8		1650	H 4.8		1653	L 2.2
	2205	L 0.8		2131	H 3.5		2319	L 0.6		2228	H 2.9
7	0358	H 3.8	15	0415	L 1.5	23	0512	H 3.8	31	0513	L 1.8
Sa	0951	L 0.8	Su	1043	H 3.3	M	1104	L 0.8	Tu	1210	H 3.2
	1612	H 4.8		1702	L 1.8		1723	H 4.7		1848	L 2.1
	2239	L 0.6		2304	H 3.3		2351	L 0.7		----	-----
8	0432	H 3.9	16	0540	L 1.5	24	0545	H 3.8			
Su	1025	L 0.7	M	1213	H 3.5	Tu	1137	L 0.8			
	1646	H 4.8		1842	L 1.7		1756	H 4.5			
	2314	L 0.6		----	-----		----	-----			

DAY	SUNRISE	SUNSET
2	0715	1845
12	0721	1848
22	0726	1853

RECLASSIFIED PER DOE
LETTER DATED JULY, 15, 1994
FROM ANTON SINISCALLI TO
MARIE S. HIXON



SCALE 1"=300'



P.I. "C"	N 138,387.19	E 51,196.73
ALICE	N 138,951.392	E 52,852.237

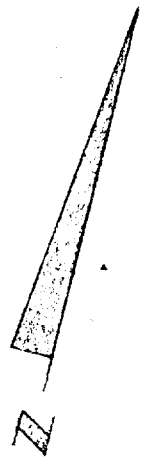
△ To Date 11-30-55 A.I.

DATE		GENERAL CONTROL LAYOUT
1-12-54		
DRAWN	CHECKED	SITE ALICE
ES	J.D.	

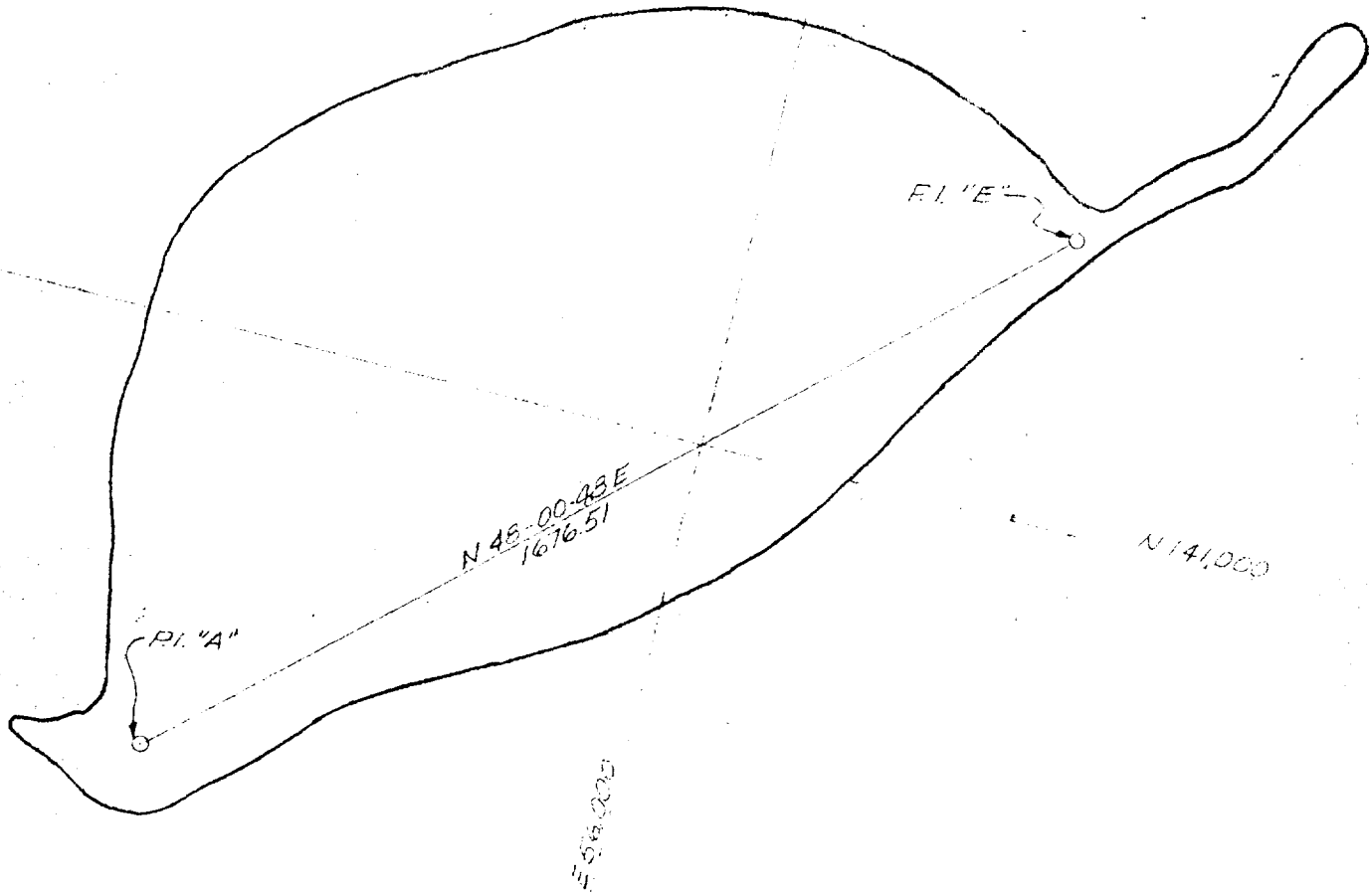
~~OFFICIAL USE ONLY~~

P.I. "A" N 140,329.99 E 55,256.51 ELEV. 8.06

P.I. "E" N 141,451.50 E 56,502.66 ELEV. 8.16



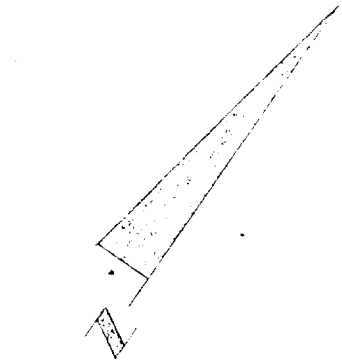
SCALE 1" = 300'



DATE: 4-19-54	GENERAL CONTROL LAYOUT
DRAWN: E.S. / CHECKED: J.D.	SITE BELLE

~~OFFICIAL USE ONLY~~

OFFICIAL USE ONLY



SCALE 1" = 300'

OCEAN

E 60,000

E 61,000

1½ STA. 520

N 144,000

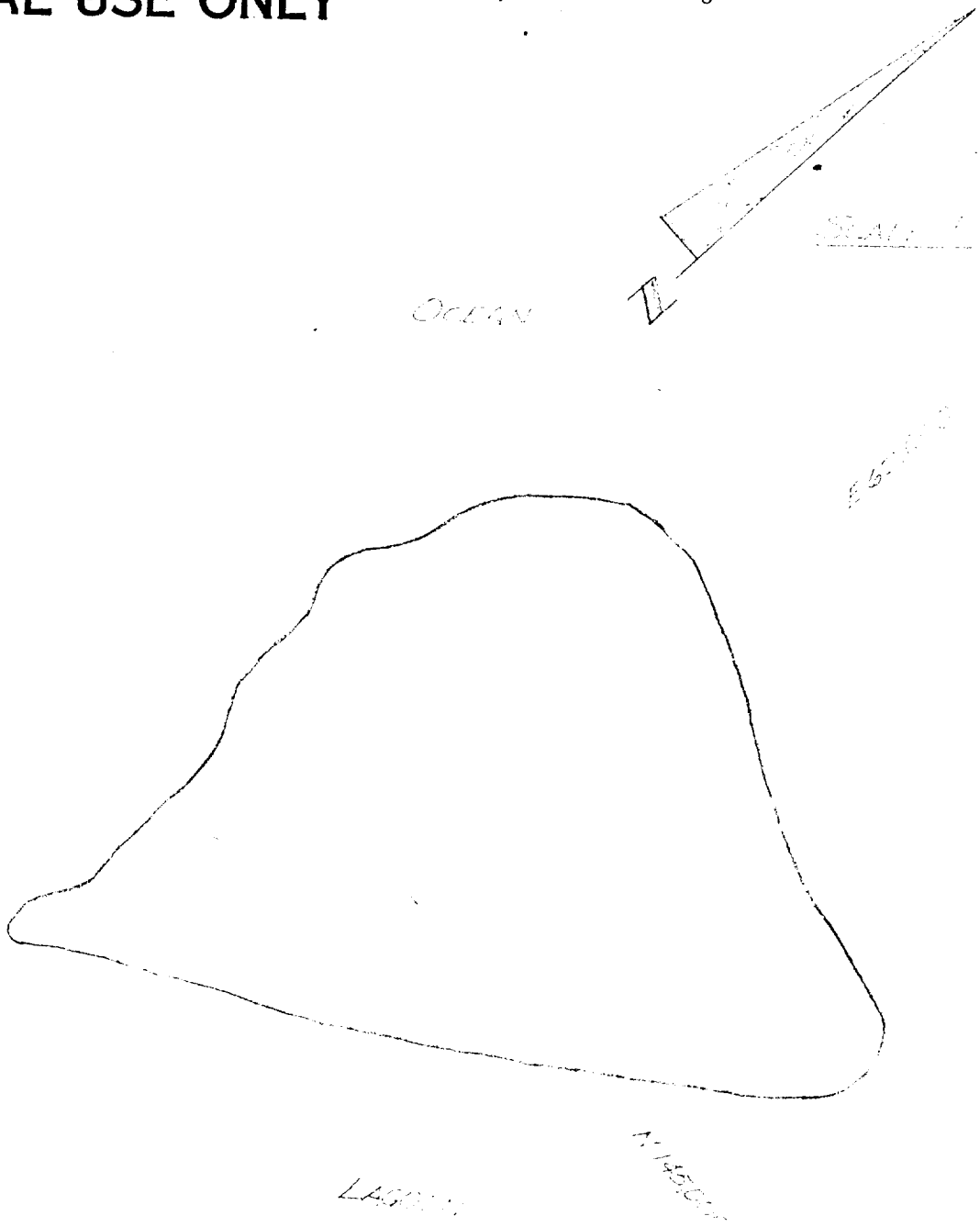
LAGOON

N 144,061.00
E 61,230.00

DATE 4 - 1 - 84		GENERAL CONTRACT LAYOUT
DRAWING E-1	CHECKED	SITE CLEARING

OFFICIAL USE ONLY

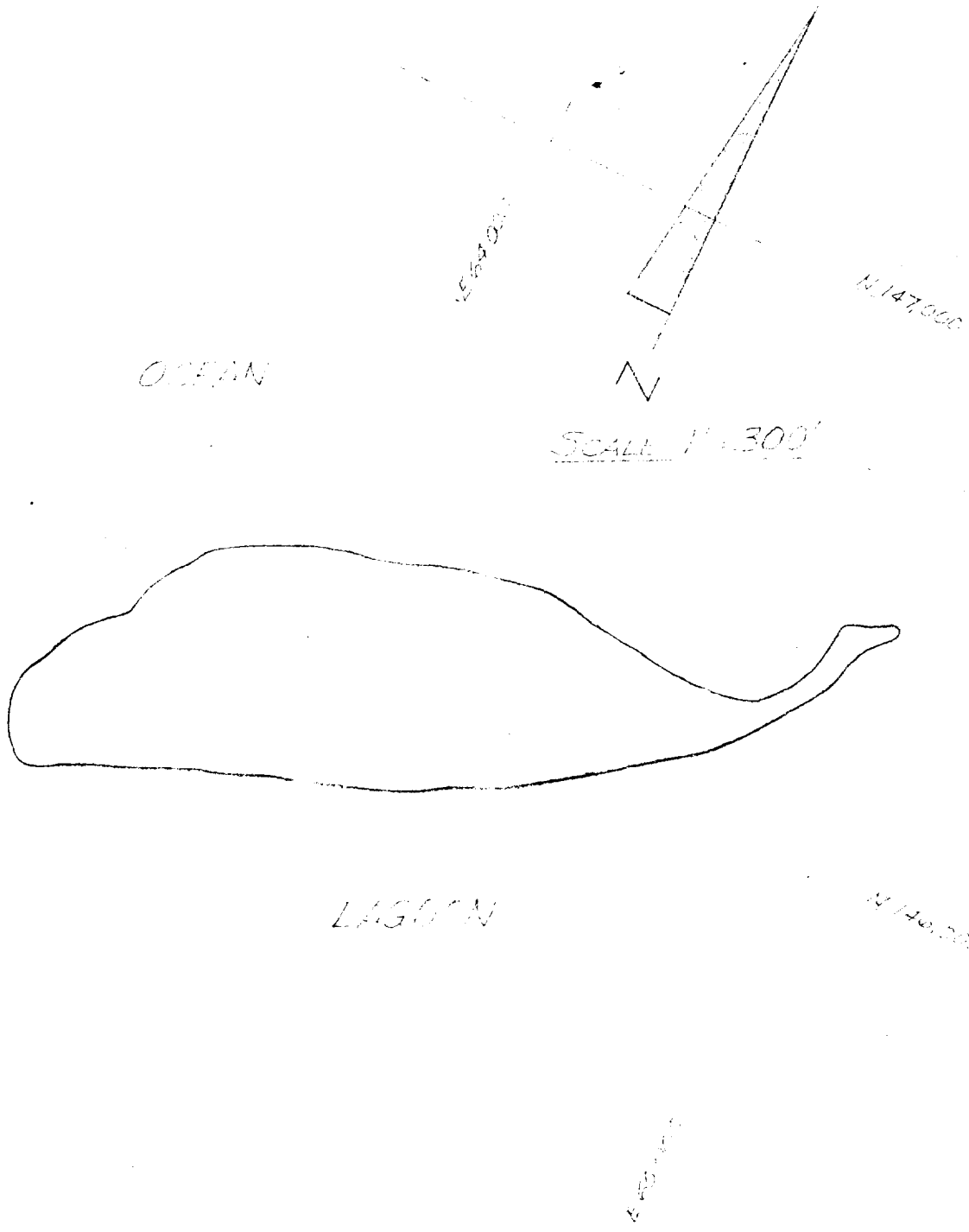
~~OFFICIAL USE ONLY~~



~~OFFICIAL USE ONLY~~

DATE 4-1-54
DRAWN ES
ALNE CONTROL UNIT

~~OFFICIAL USE ONLY~~

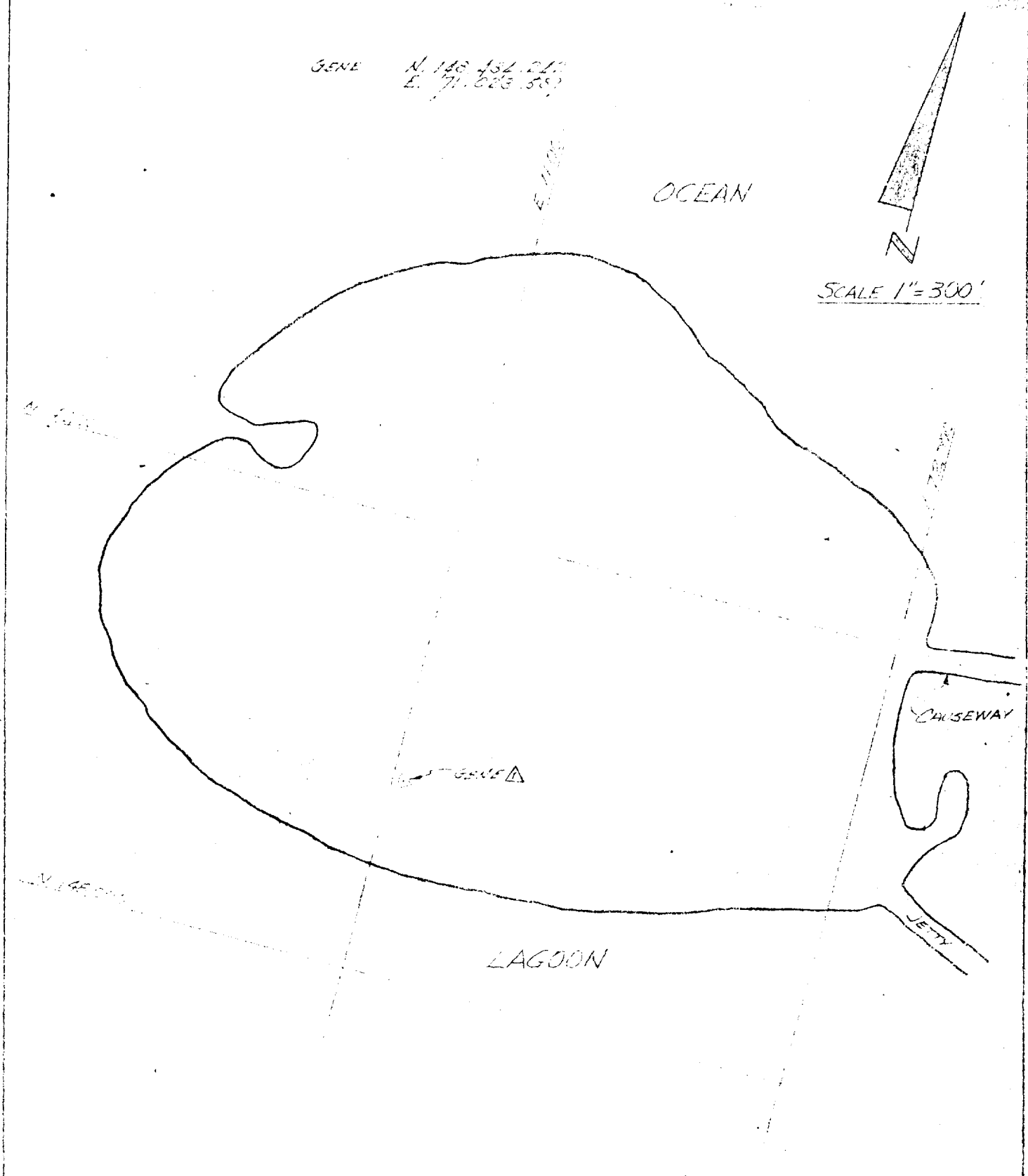


~~OFFICIAL USE ONLY~~

DATE 4-19-54		GENERAL CONTROL LAYOUT
DRAWN ES	CHECKED JLD	SITE ELNA

3-5

~~OFFICIAL USE ONLY~~

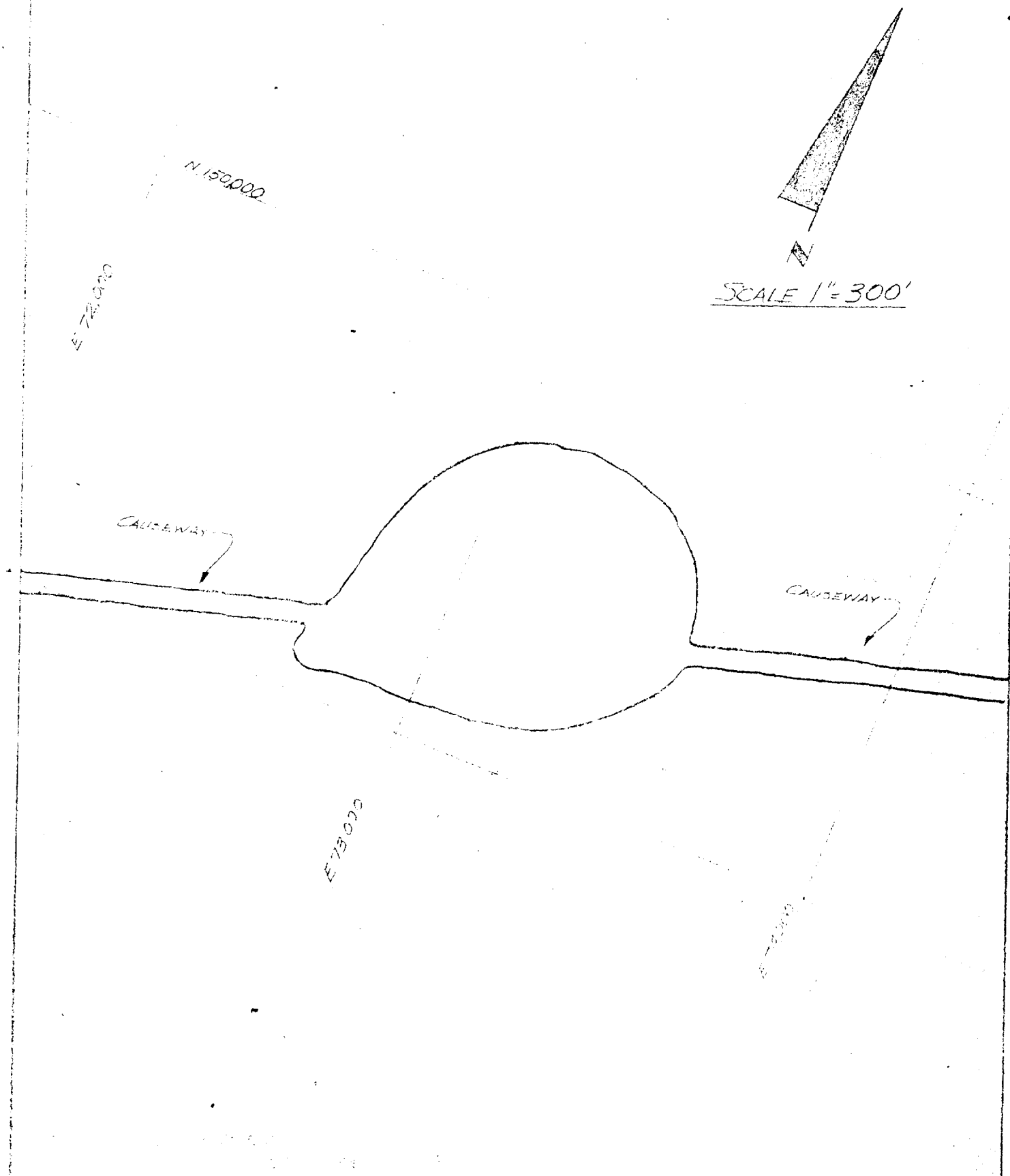


△ To Date 11-30-55 AM

~~OFFICIAL USE ONLY~~

DATE 4-16-54	GENERAL CONTROL LAYOUT
DRAWN ES / CHECKED	SITE GENE

OFFICIAL USE ONLY

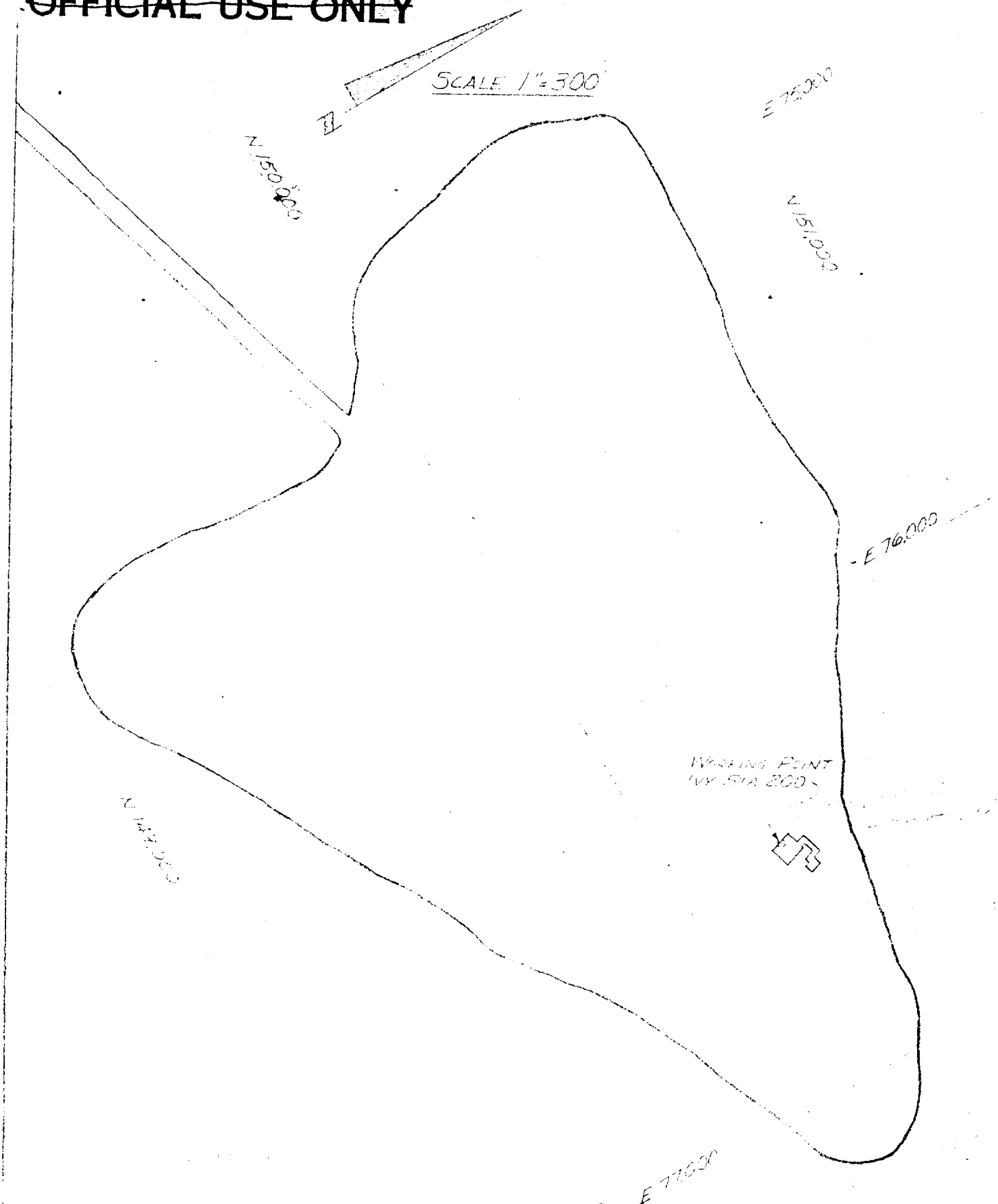


△ To Date 11-30-55 AM

DATE 4-16-54		GENERAL CONTROL LAYOUT
DRAWN ES	CHECKED MMM	SITE HELEN

OFFICIAL USE ONLY

OFFICIAL USE ONLY

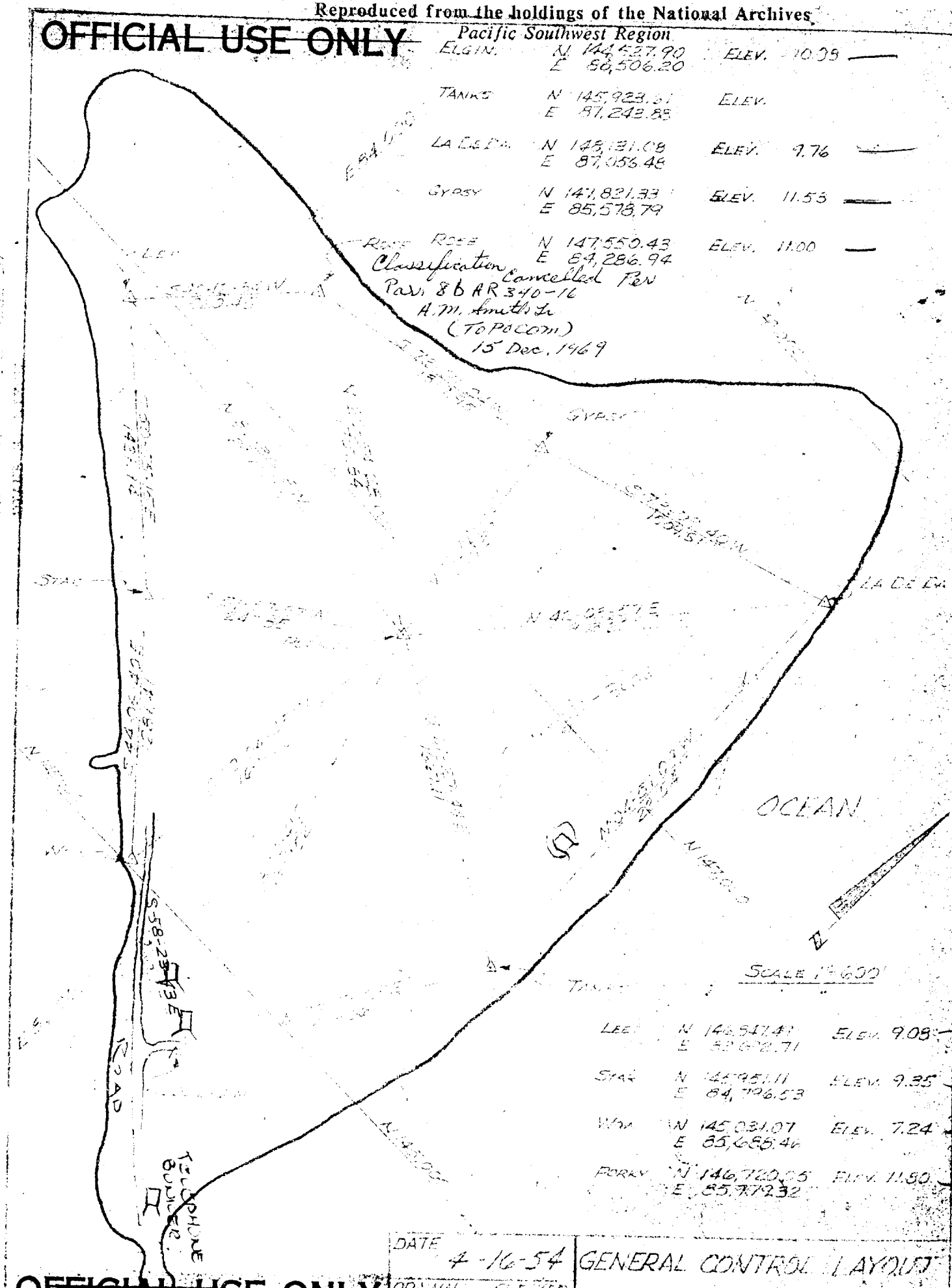


OFFICIAL USE ONLY

W.P. STA. [illegible] N 151,243.57
E 74,437.66

△ To date 11-30-55 HW

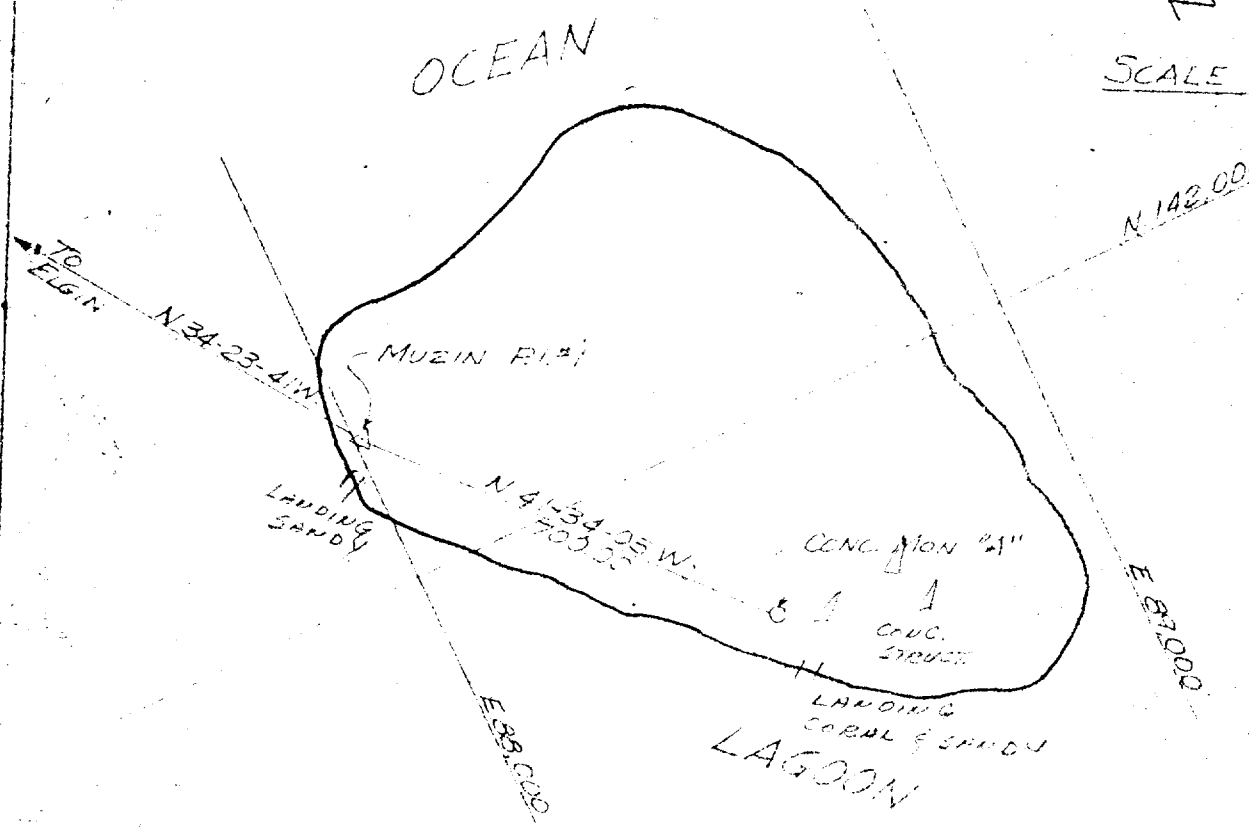
DATE	GENERAL CONTROL LAYOUT
4-16-54	
DRAWN: E.S. / CHECKED: J.O.	SITE IRENE



DATE		
4-16-54	GENERAL CONTROL LAYOUT	
DRAWN	CHECKED	SITE JANET
EC	J.O.	

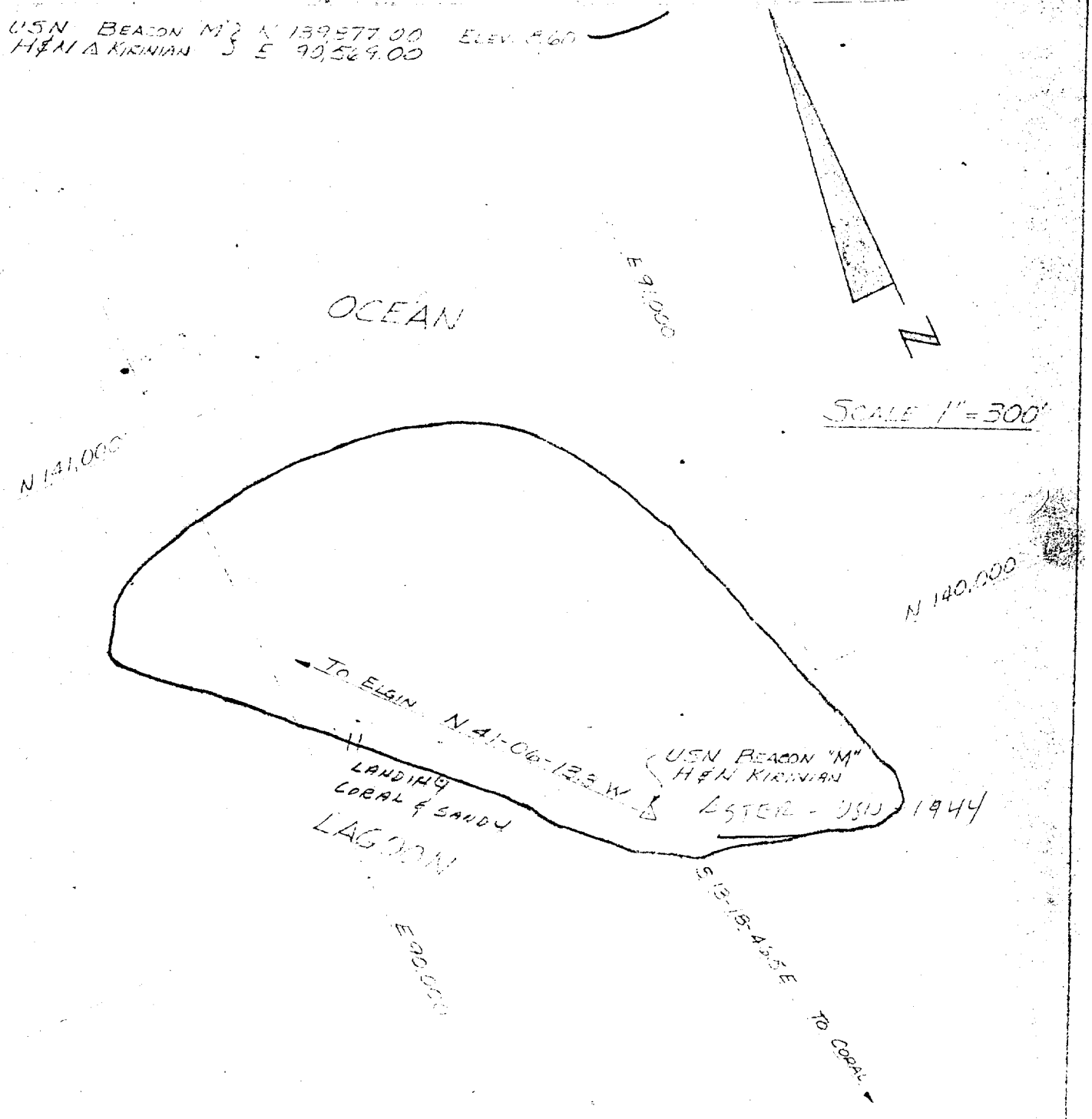
MUZIN PT. #1 N 142,332.60 E 88,009.20 6.40

CONC MON. "A" N 141,809.92 E 88,173.49 8.72



DATE 4-17-54		GENERAL CONTROL LAYOUT
DRAWN E.S.	CHECKED J.O.	SITE KATE

OFFICIAL USE ONLY



OFFICIAL USE ONLY

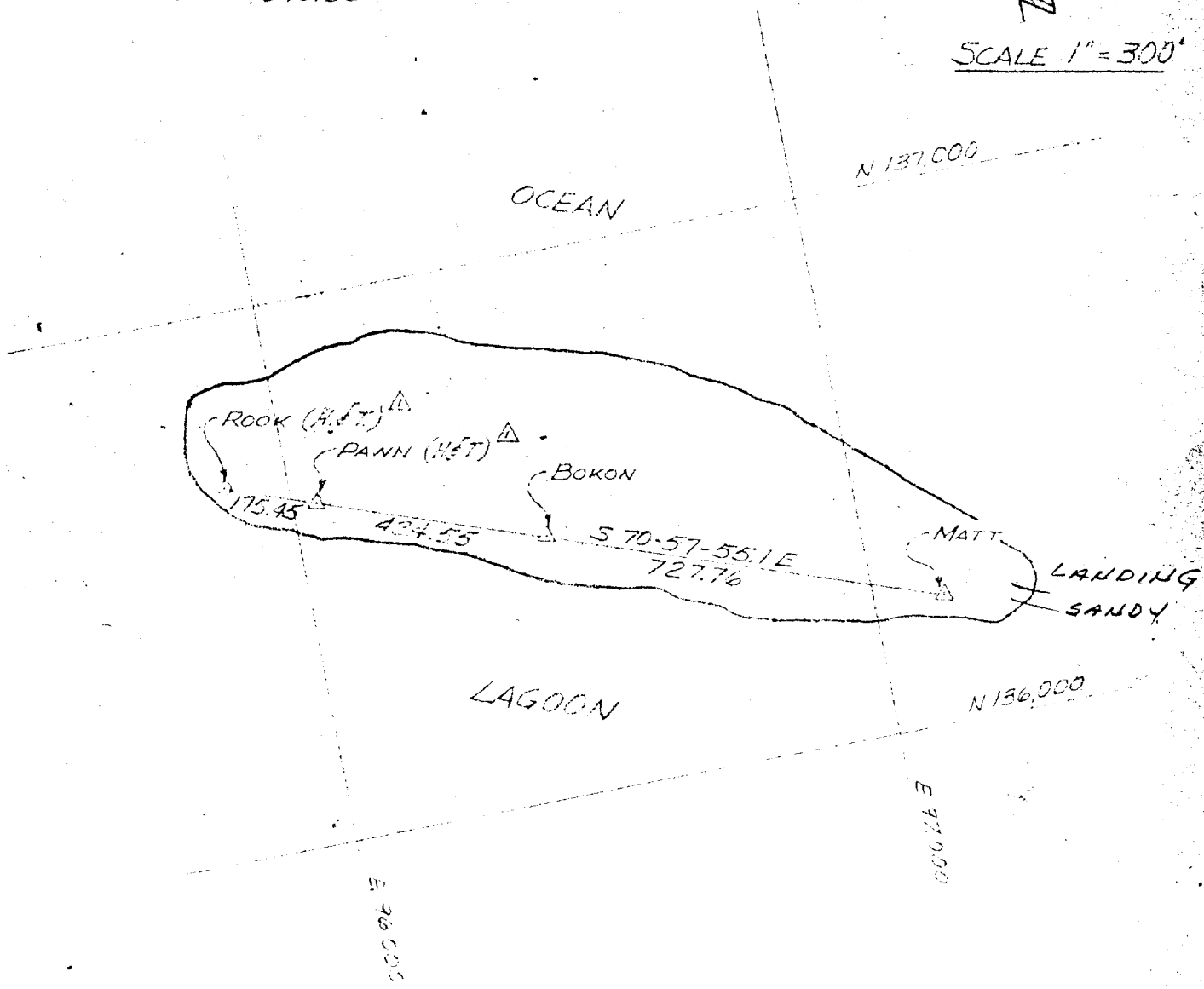
DATE 4-17-54		GENERAL CONTROL LAYOUT
DRAWN ES	CHECKED J.O.	SITE LUCY

OFFICIAL USE ONLY

BOKON	N 136 470.80 E 96,44 1.70	ELEV.	10.40
MATT	N 136,233.45 E 97,129.67	ELEV.	9.53
ROOK	N 136,666.48 E 95,874.51	ELEV.	10.04
PAWN	N 136,609.26 E 96,040.36	ELEV.	8.64

N

SCALE 1" = 300'



DECLASSIFIED PER DOE
[illegible]

△ TO DATE 11-30-55 MH

OFFICIAL USE ONLY

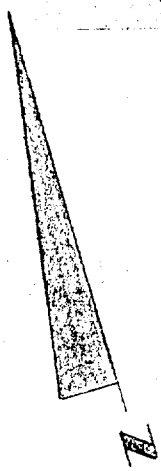
DATE	
4-19-54	GENERAL CONTROL LAYOUT
DRAWN: ES	CHECKED: J.C.
	SITE MARY

~~OFFICIAL USE ONLY~~

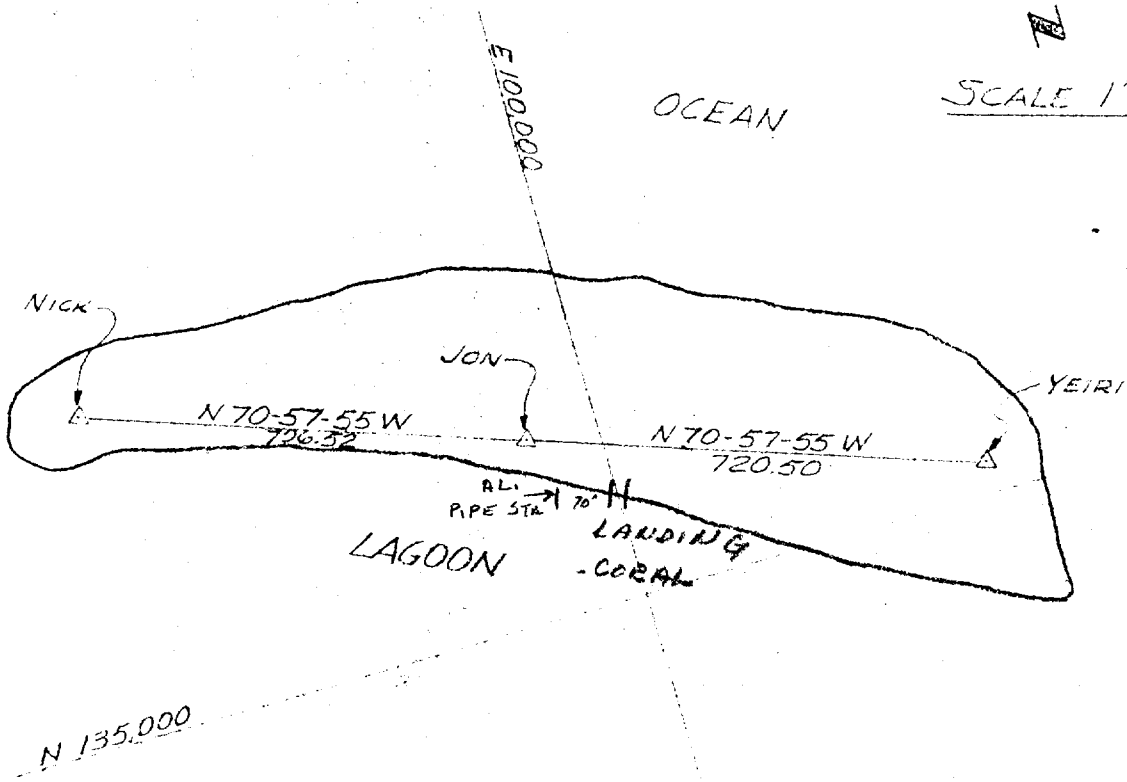
YEIRI N 135,047.55 ELEV 9.96
E 99,567.01

NICK N 135,512.99 ELEV 10.54
E 99,218.02

JON N 135,282.56
E 99,385.91



SCALE 1"=300'

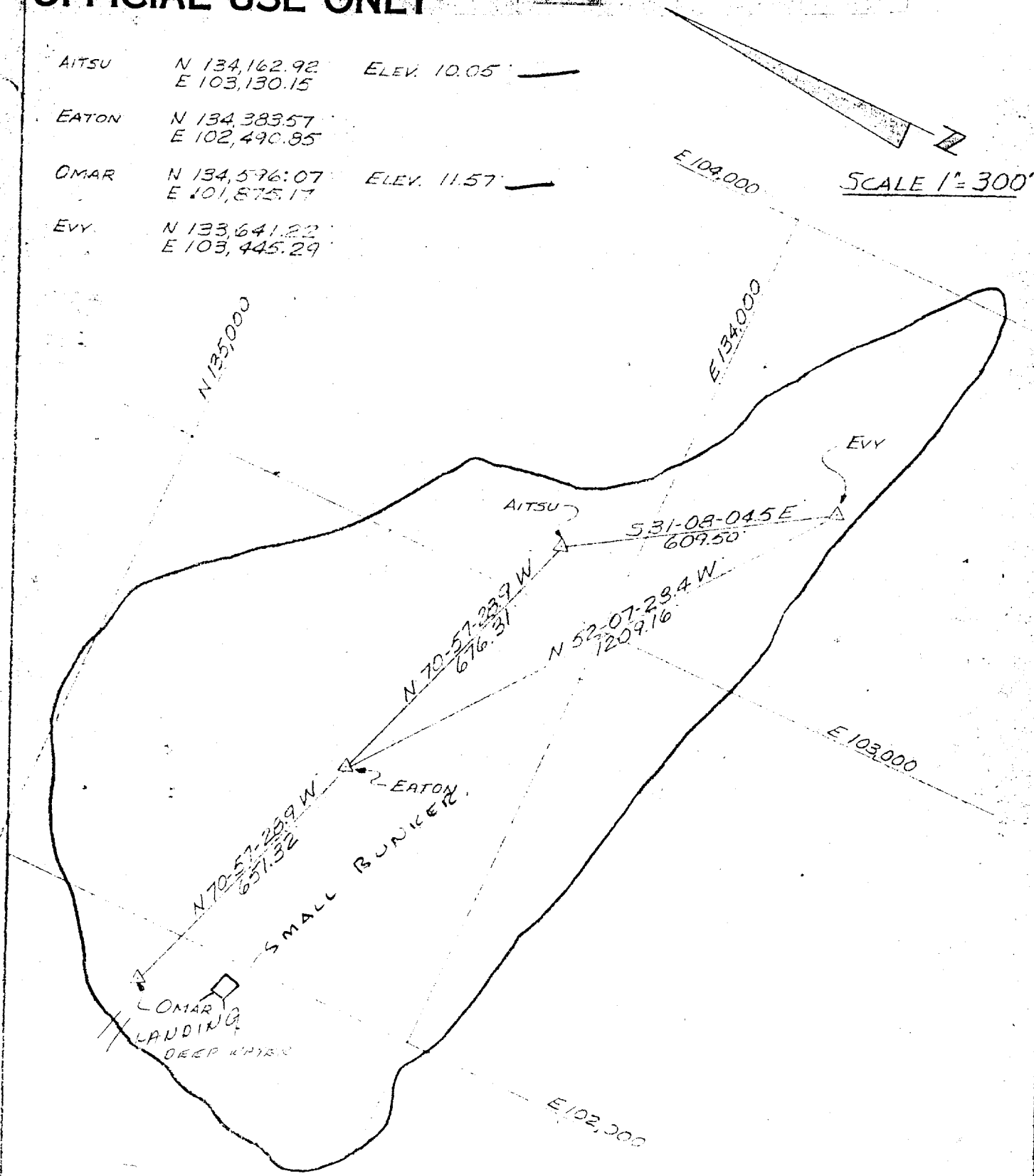


~~OFFICIAL USE ONLY~~

DATE 4-11-54	GENERAL CONTROL LAYOUT
DRAWN ES / CHECKED J.O.	SITE NANCY

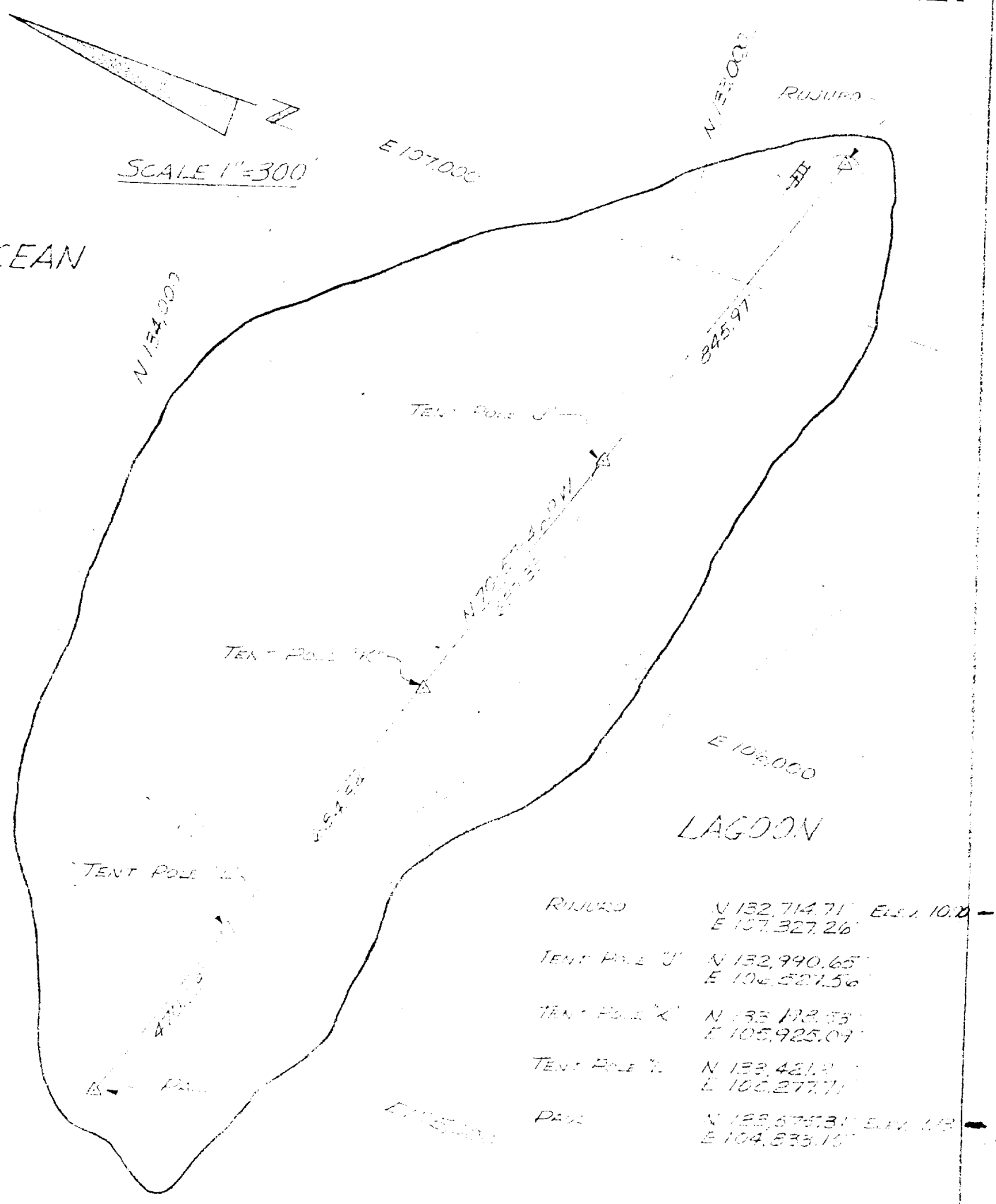
OFFICIAL USE ONLY

AITSU	N 134,162.92 E 103,130.15	ELEV. 10.05
EATON	N 134,383.57 E 102,490.85	
OMAR	N 134,596.07 E 101,875.17	ELEV. 11.57
EVY	N 133,641.22 E 103,445.29	



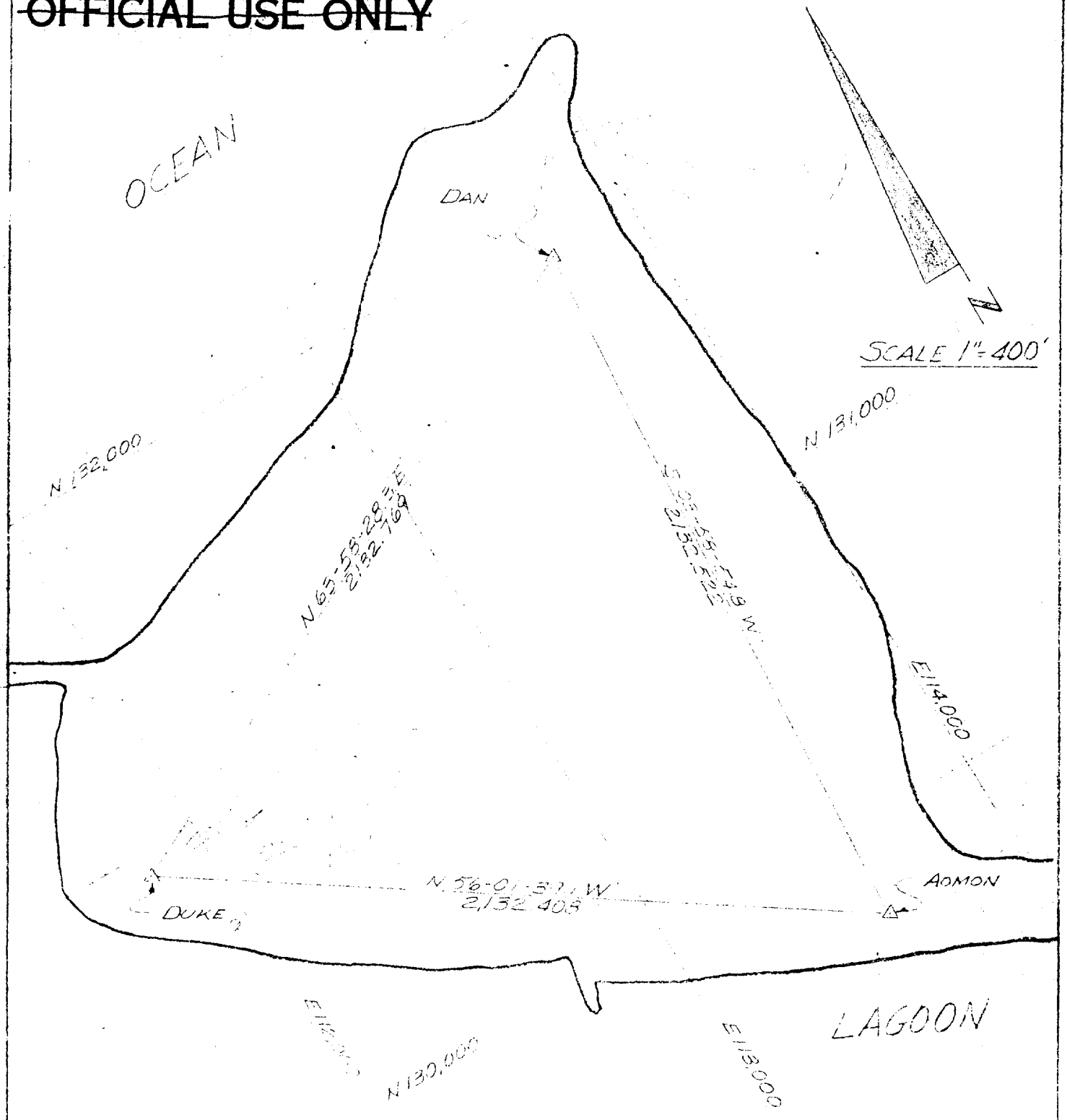
OFFICIAL USE ONLY

DATE 4-19-54		GENERAL CONTROL LAYOUT
DRAWN E.S.	CHECKED J.C.	SITE OLIVE



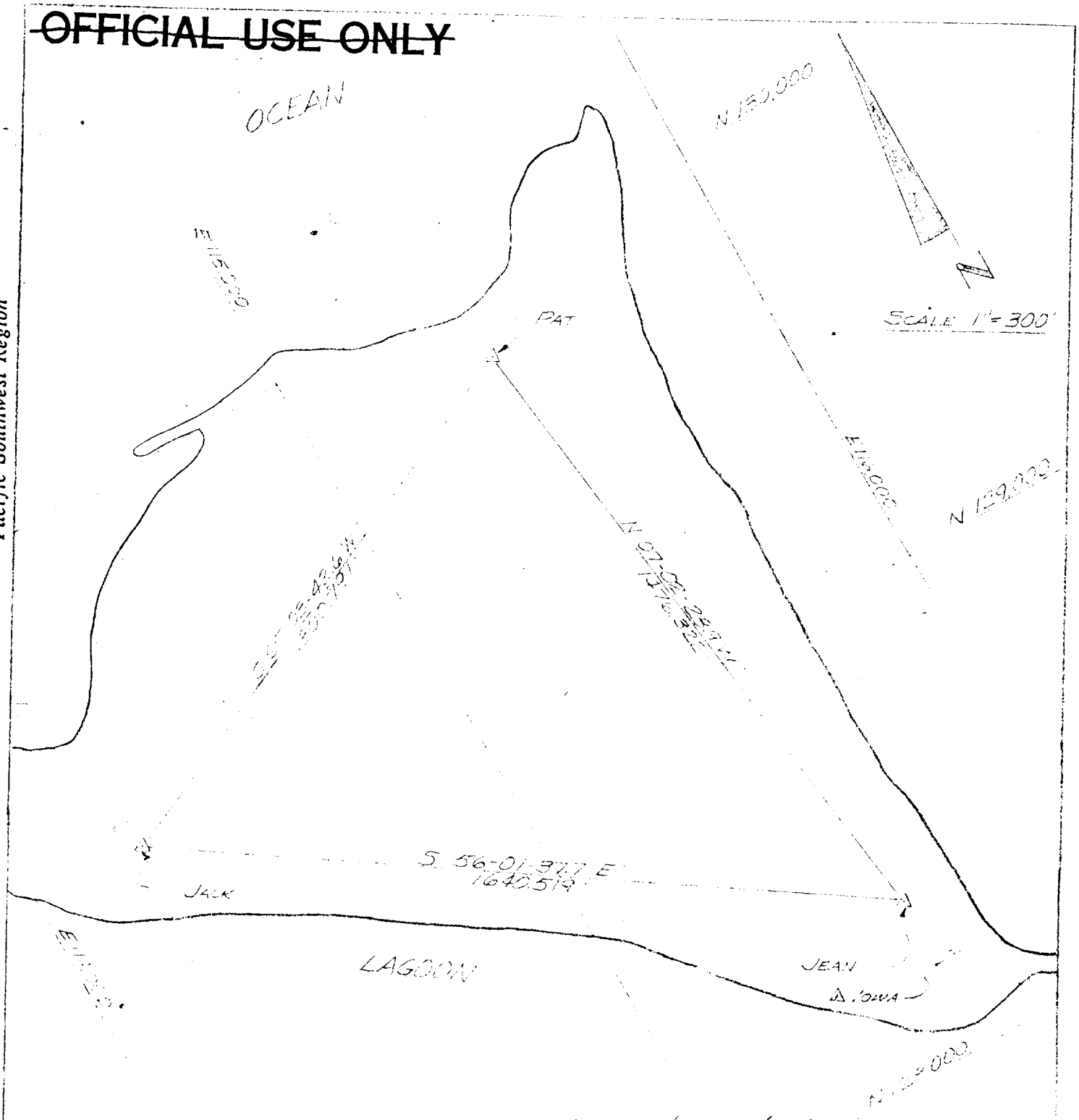
DATE 1 [illegible] 64		GENERAL CONTROL LAYOUT
DRAWN ES	CHECKED JJC	SITE PEARL

42 E (41)

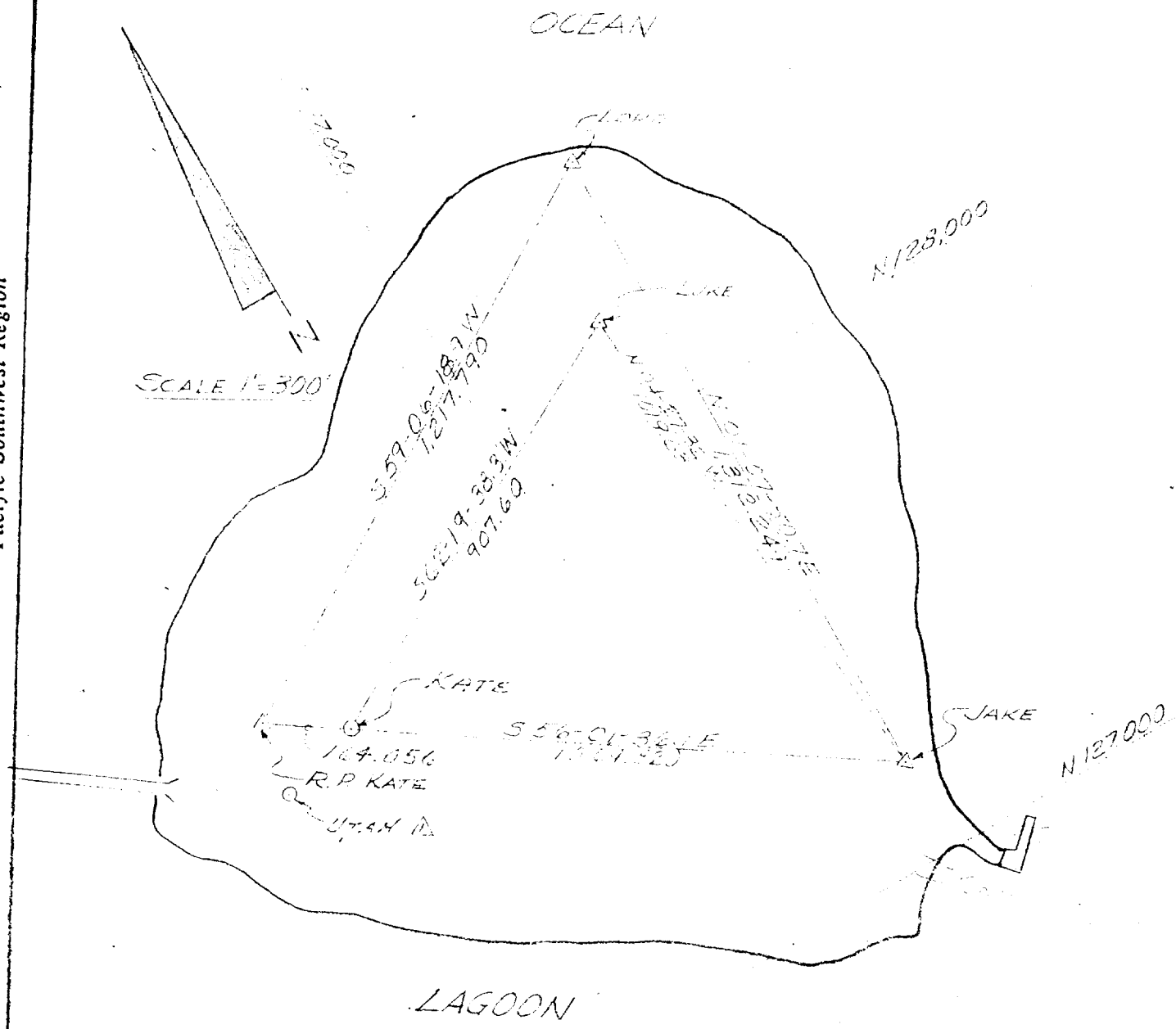


DUKE	N 124,243.075 E 111,[illegible].69	ELEV. 6.10
DAN	N 151,[illegible].575 E 119,722.065	ELEV. 18.40
AOMON	N 124,[illegible].70 E 119,[illegible].55	ELEV.

DATE 4-14-54		GENERAL CONTROL LAYOUT
DRAWN ES	CHECKED J.O.	SITE SALLY



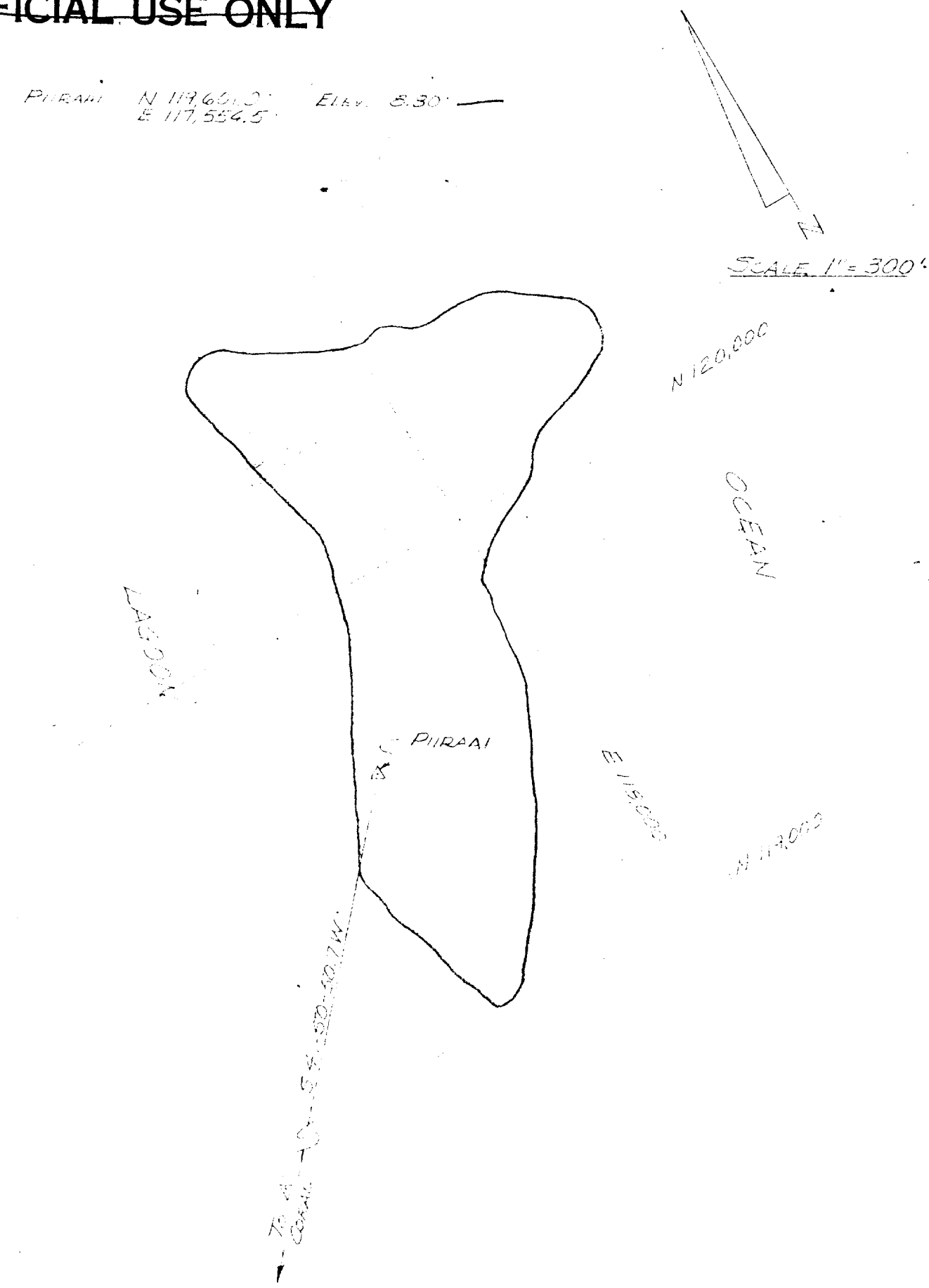
Δ 1 DATE 11-30-55 MM	DATE 4-11-56	GENERAL CONTROL LAYOUT
	DRAWN ES / CHECKED J.D.	SITE TULDA



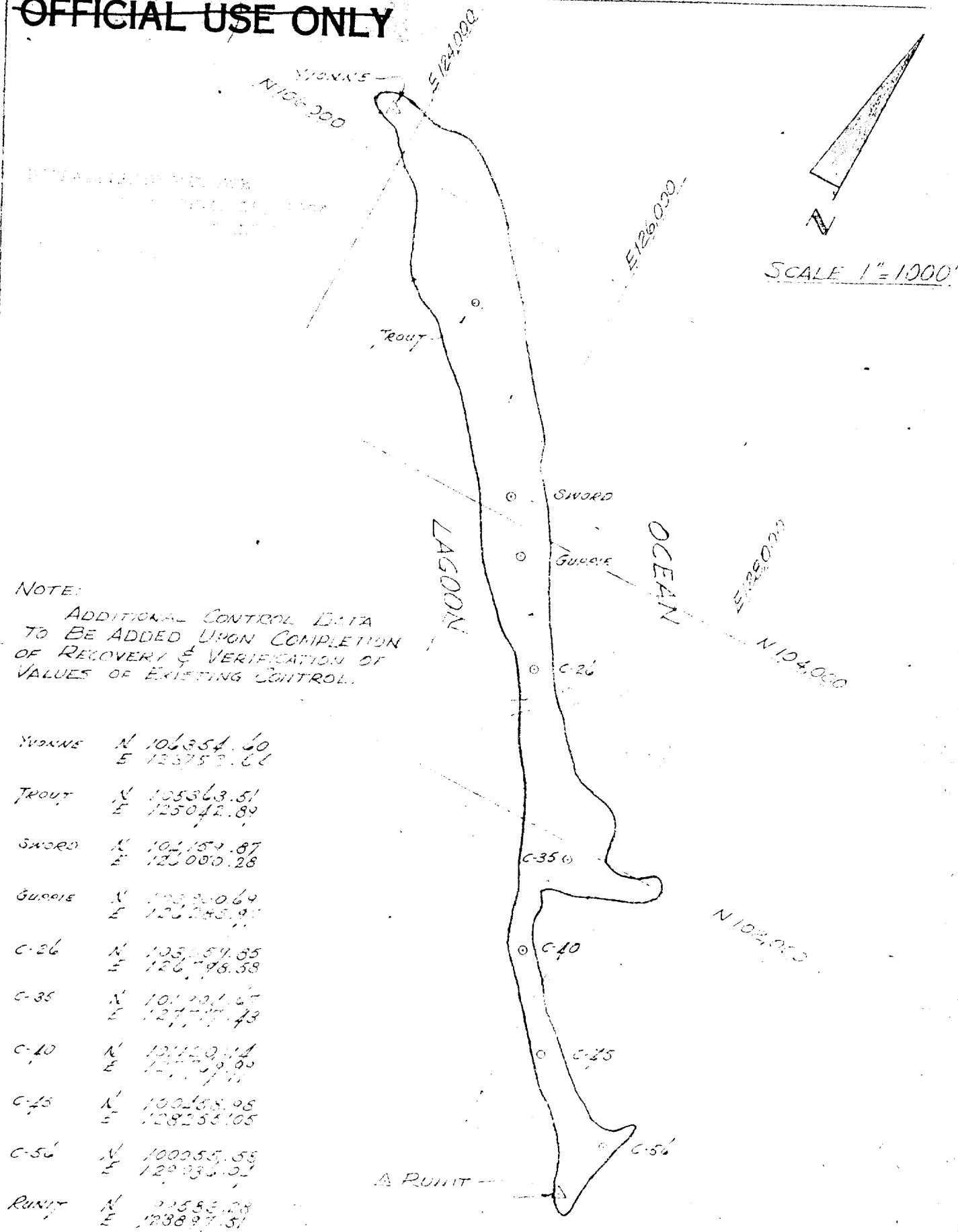
STAH	N 127,735.53 E 116,320.92
KATE	N 127,795.22 E 116,483.29
R.P. KATE	N 127,976.873 ELEV. 8.33 E 116,347.239
JAKE	N 127,190.199 E 117,366.343
LORD	N 128,502.151 E 117,342.239
LAKE	N 126,206.73 E. [illegible] E 117,257.07

L. TO DATE 11-30-55 J.M.

DATE	4-20-54	GENERAL CONTRO. LAYOUT
DRAWN	CHECKED	SITE URSULA
ES	JD	



DATE 4-19-54		GENERAL CONTROL LAYOUT
DRAWN ES	CHECKED J.D.	SITE WILMA

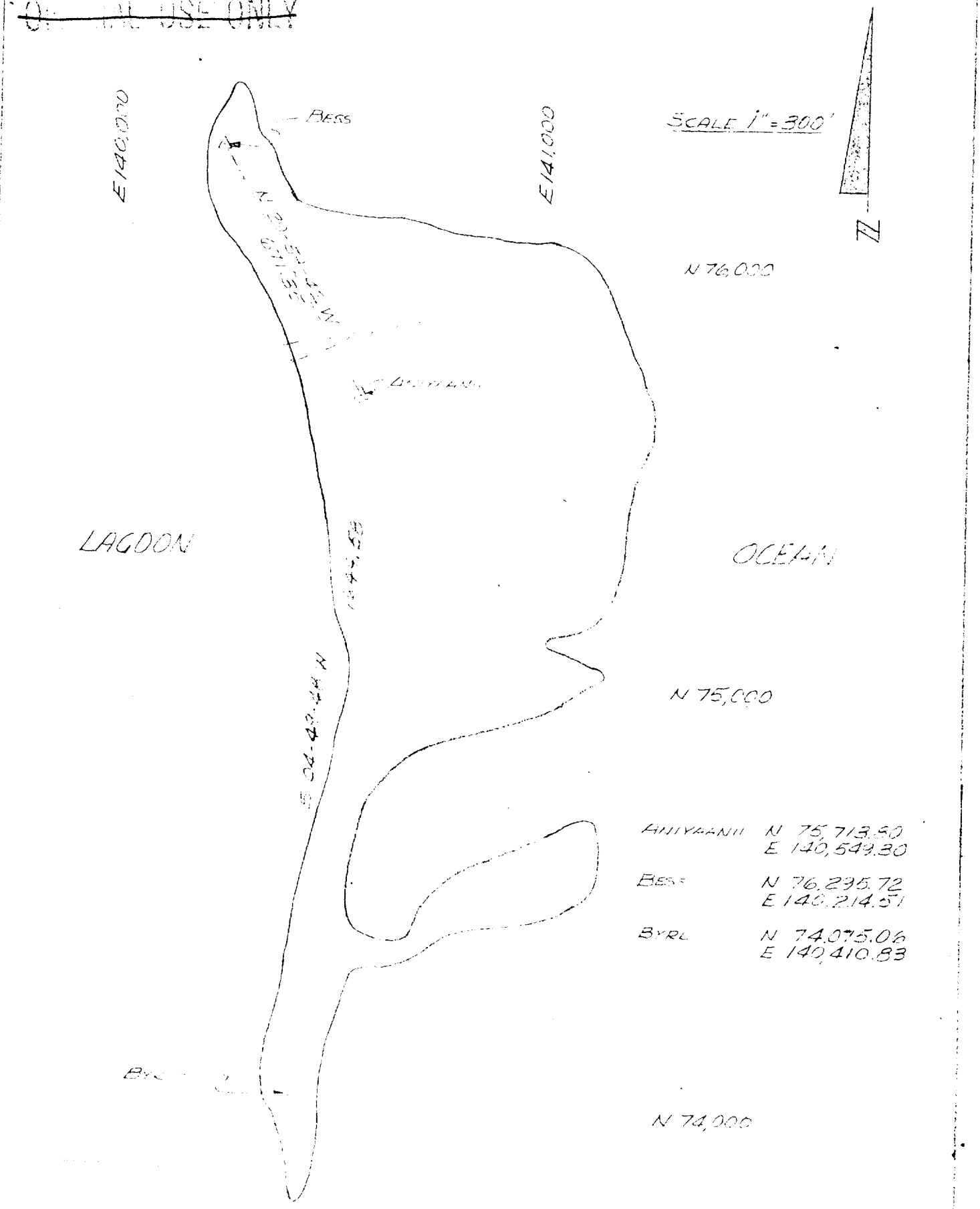


NOTE:

ADDITIONAL CONTROL DATA TO BE ADDED UPON COMPLETION OF RECOVERY & VERIFICATION OF VALUES OF EXISTING CONTROL.

YVONNE	N	106354.60
	E	123758.22
TROUT	N	105363.51
	E	125042.89
SWORD	N	101159.87
	E	125000.28
GUPPIE	N	103210.64
	E	125285.91
C-26	N	105459.85
	E	126498.38
C-35	N	101201.67
	E	127[illegible].43
C-40	N	101[illegible].14
	E	127[illegible].65
C-45	N	100[illegible].98
	E	128[illegible].05
C-56	N	100855.69
	E	129[illegible].92
RUNIT	N	[illegible]
	E	128897.51

DATE		GENERAL CONTROL LAYOUT
4-19-54		
DRAWN	CHECKED	SITE YVONNE
ES	J.D.	



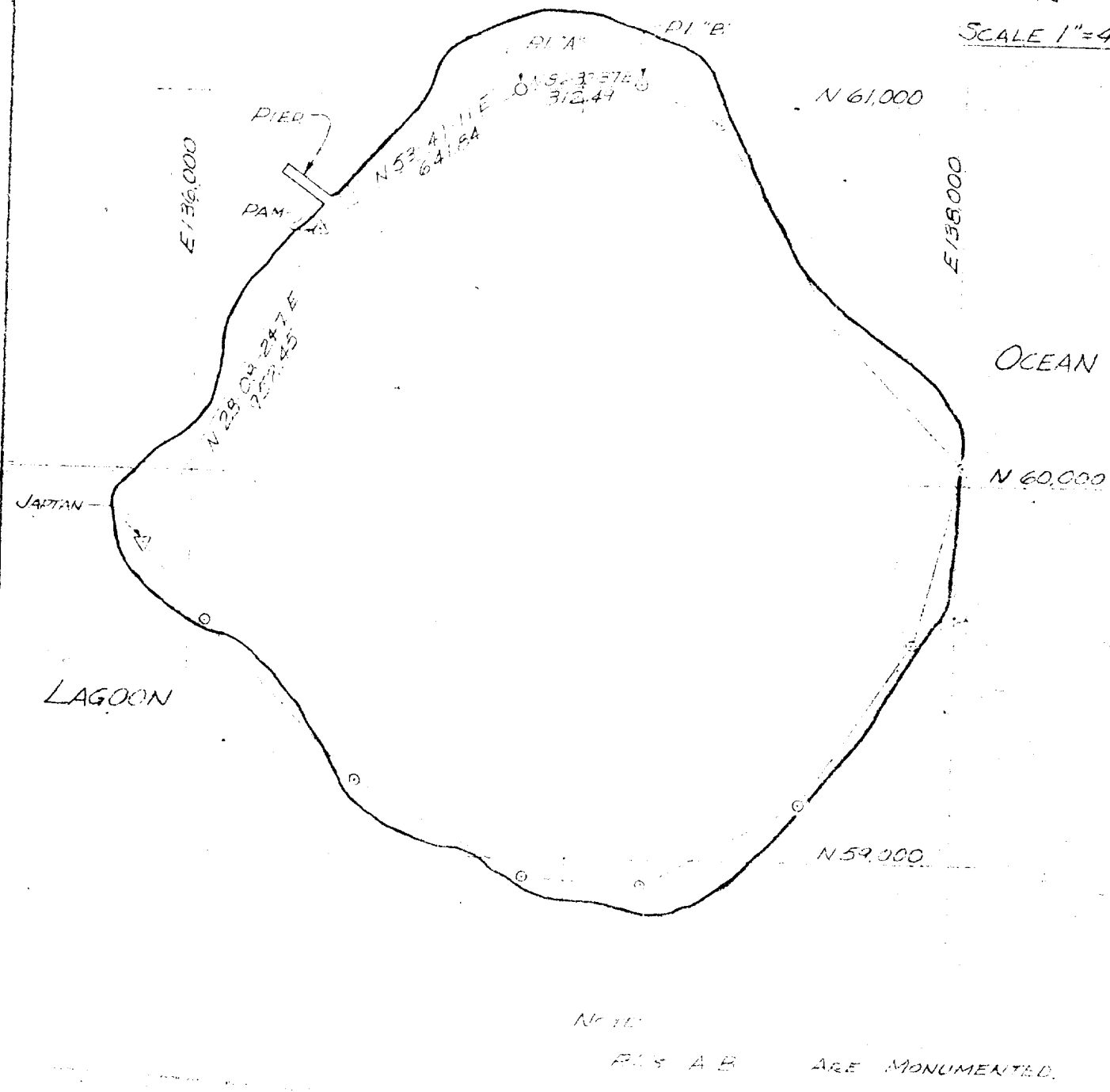
DATE 8-4-80		GENERAL CONTROL LAYOUT SITE BRUCE
DRAWN ES	CHECKED NCA	

JAPTAN N 59,804.90 E 135,579.90

PAM N 60,644.67 ELEV. 9.41 E 136,324.13

PI "A" N 61,024.56 ELEV. 10.11 E 136,641.62

PI "B" N 61,043.16 ELEV. 11.09 E 137,159.54



DATE 4-20-54		GENERAL CONTROL LAYOUT
DRAWN ES	CHECKED JO	SITE DAVID

~~OFFICIAL USE ONLY~~

SITE FRED

BUILDING & STRUCTURE NUMBERS

HOLMES & NARVER, INC.

REVISED TO 1 OCT. 1956

MISC. 415

NOTE: Any corrections or changes to this list should be made only on the master list which is maintained in the Office Engineering & Design Department of the Engineering Division

~~OFFICIAL USE ONLY~~

54

GENERAL NOTES

1. For further information on sizes and types of buildings, refer to the As-Built Drawings.

*2. Column denoted by an asterisk contains numbers which represent General Layout Drawing Number or area on which building appears on the new 1" - 50' topographic sheets.

3. The building numbers in this index pertain to Holmes & Narver Plans, General Layouts and Survey notes.

4. Symbol beside building number (M) indicates Military owned building or structure.

5. Symbol beside building number (C) indicates A.E.C. owned building or structure that is capitalized, or, Construction-Work-Is-In-Progress.

55

SITE FRED

BLDG. NO.	SIZE	USE	TYPE	#
1 - M	96'x115'	E.M. Recreation (Navy)	Wood & Corr. Metal, "T" Shape	1
1A - M	12'x12'	Latrine	Wood	1
2 - M	20'x68'	Officers Beach Club	"L" shape, wood & Corr. Transite	1
	20'x28'		Wood & Corr. Transite	
3 - C	24'x24'	Transmitter (Power)	Prefabricated Aluminum	2
4 - C	24'x120'8½"	Receiver	Prefabricated Aluminum	2
4A- C	8½x8½'	Storage Shed	Wood Frame on 4x4 Wood Foundation	2
5 - C	24'x36'8½"	Shower & Latrine	Prefabricated Aluminum	2
6 - C	24'x36'8½"	Shower & Latrine	Prefabricated Aluminum	2
7 - C	24'x36'8½"	Shower & Latrine	Prefabricated Aluminum	2
8 - C	24'x36'8½"	Shower & Latrine	Prefabricated Aluminum	2
9 - C	8'x12'x6'8½"	Open Air Shower & Latrine	Canvas on Wood	6
10 - C	24'x128'8½"	Quarters, 36 Man	Prefabricated Aluminum	3
11 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	3
12 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	3
13 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	3
14 - C	24'x24'8½"	Dispatcher Shack	Prefabricated Aluminum	5
15 - C	24'x172'8½"	Group HQ, "H" shape	Prefabricated Aluminum	3
	24'x148'8½"		Prefabricated Aluminum	3
	24'x31'8½"		Prefabricated Aluminum	3
15A - C		Assigned to Incinerator	Concrete & Brick	3
16 - C	24'x100'8½"	P.O., P.X. & B.S.	Prefabricated Aluminum	3
	2-24'x50'8½"	with 3 wings	Prefabricated Aluminum	3
	24'x28'8½"		Prefabricated Aluminum	3
	24'x24'8½"		Prefabricated Aluminum	3
17 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	2
18 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
19 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
20 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
21 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
22 - C	24'x68'8½"	Hospital Wards	Prefabricated Aluminum	3
23 - C	24'x68'8½"	Hospital Wards	Prefabricated Aluminum	3
24 - C	24'x138'8½"	Dispensary with 4 wings	Prefabricated Aluminum	3
	24'x94'8½"		Prefabricated Aluminum	3
	2-24'x54'8½"		Prefabricated Aluminum	3
	9'7"x14'	Lean-to Addition	Wood	3
	9'7"x10'10"	Lean-to Addition	Wood	3
25	22'0"x44'0"	Boathouse	Wood Frame	1
26 - M	38'6"x46'	AtCom Residence	Wood	3
27 - M	59'x87'7"	Officers Club	Wood	3
28 - M	7x17'	Ammo Storage	2 Steel cubes with corrugated metal top	3
29 - C	24'x60'8½"	Fire Station	Prefabricated Aluminum	3
30 - C	800 Man	Open Air Theater	Wood Proj. booth seats, and transite screen	3
31 - C	24'x148'8½"	Laundry	Prefabricated Aluminum	3
	24'x26'8½"			
	24'x84'8½"			
31A	10'x12'	Laundry Wrapping Paper Storage	Wood Shed - No Foundation	3
32		Chapel, shape of Cross	(Demolished)	
33 - C	24'x236'8½"	Reefer Bank	Prefab. Aluminum, Elevated	3

BLDG. NO.	SIZE	USE	TYPE	*
34 - C	24'x44'8½"	Boiler House	Prefabricated Aluminum	3
35 - C	50'6"x76'8½"	Bakery	Prefabricated Aluminum	4
36 - C	50'6"x76'8½"	Mess Hall	Prefabricated Aluminum	3
	50'6"x259'2"	Mess Hall	Prefabricated Aluminum	3
	50'6"x54'8½"	Mess Hall	Prefabricated Aluminum	3
	50'6"x82'8½"	Mess Hall	Prefabricated Aluminum	3
	2-24'x22'8½"	Scullery	Prefabricated Aluminum	3
	24'x22'8½"	Heater Rm & Dry Storage	Prefabricated Aluminum	3
	8'6"x10'	Garbage	Wood	3
	16'x12'6"	Pot Washing	Wood	3
	24'x45'10½"	Storage Supply	Prefabricated Aluminum	3
	24'x24'8½"	Butcher Shop	Prefabricated Aluminum	3
36A	18'x70'	Reefer Shelter	Wood	3
37 - C	24'x173'8½"	Commissary W/6 reefers	Prefabricated Aluminum	4
38 - C	24'x68'8½"	Quarters, 18 Man BOQ	Prefabricated Aluminum	4
39 - C	24'x68'8½"	Quarters, 18 Man BOQ	Prefabricated Aluminum	4
40 - C	24'x68'8½"	Quarters, 18 Man BOQ	Prefabricated Aluminum	4
41 - C	24'x68'8½"	Quarters, 18 Man BOQ	Prefabricated Aluminum	4
42 - C	24'x68'8½"	Quarters, 18 Man BOQ	Prefabricated Aluminum	4
43 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4
44 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4
45 -				
46 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	4
47 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	4
48 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	4
49 -	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	4
50 - C	24'x140'8½"	Quarters, 72 Man	Prefabricated Aluminum	4
51 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4
52 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4
53 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4
54 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	5
55 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	5
56 - C	51'8"x136'8½"	Power & Dist. Plant	Prefabricated Aluminum, Elevated	5
56A-C	33'10"x55'	Badger Shed	Wood & Corr Aluminum	5
56B -	10'2"x10'4"	Pump House	Corr. Aluminum	5
57 - C	24'x12'8½"	Laboratory	Prefabricated Aluminum	6
58 - M		Ordnance Warehouse	(Demolished)	
59 - M	40'x100'	Ordnance Warehouse	Jumbo Quonset	8
60 - M	40'x100'	General Whse.	Jumbo Quonset	8
61 - M	40'x100'	Gear Loft	Jumbo Quonset	7
62 - M	40'x100'	Salvage Warehouse	Jumbo Quonset	8
63 - M		Special Service Whse	(Demolished)	
64 - M		Ordnance Shop	(Demolished)	
65 - M		Q.M. Supply	(Demolished)	
66 - M	40'x100'	Q.M. Sales & Stores	Jumbo Quonset	7
67 - M	40'x100'	Q.M. Expendable Whse	Jumbo Quonset	7
68 - M	70'x81'	Reefer Bank and Packing and Crating Bldg.	[illegible] (Demolished)	
69 - M		Warehouse	(Demolished)	
70				-
71 - M	40'x100'	Warehouse	Jumbo Quonset	7
72 -	20'x60'	Square & Compass Club	2-Story Quonset	7
73 - M	40'x100'	Army Engineer Whse.	Jumbo Quonset	7

BLDG. NO.	SIZE	USE	TYPE	*
74 - M	40'x100'	P.X. Warehouse	Jumbo Quonset	7
75 - M	40'x100'	H & N Warehouse	Jumbo Quonset	7
76 - M	40'x100'	Army Supply Whse	Jumbo Quonset	7
77 - C	24'x80'8½"	Drone H.Q.	Corr. Prefab. Aluminum	13
78 - M	21'x21'	Aircraft Decontamination Office	Plywood	15
79 - M	40'x100'	Electronic Control	Jumbo Quonset	13
80 - M	40'x196'	Bulk Storage	Jumbo Quonset	13
81	15'x15'	Tower	Wood w/concrete piers	16
82 - M	80'x100'	Aircraft Maintenance Shop	(2) Butler Type	12
83 - M		Signal Corps Whse.	Demolished	
84		Transmitter (Power)	Demolished	
85 - C	24'x56'8½"	Receiver	Prefabricated Aluminum	12
86				
87 - C	10'7½"x10'7¼"	Hydrogen Storage	Wood and Aluminum	18
88 - C	15'x15'	Weather Station	Wood and Aluminum	18
89 - C	24'x96'8½"	Base Operations "U"	Prefabricated Aluminum	16
	24'x78'8½"	Shape	Prefabricated Aluminum	16
	23'7½"x23'7½"	Tower	Wood and Aluminum	16
	24'x72'8½"	Terminal Whse	Prefabricated Aluminum	16
90 - C	(24'x2"x144'8½"	Air Force Task Gp HQ	Prefabricated Aluminum	16
	(3-24'x50'8½"	"E" shape W/Add N End	Prefabricated Aluminum	16
90C - M	20'x94'	Office & Storage	Wood	16
90G - M	30'x40'	Emergency Power Plant	Wood	16
91 - C	24'x20'8½"	Alert Crew Office	Pacific Iron & Steel Bldg.	16
91A	57'x22'	Crash Truck Shelter	Wood	16
92 - C	24'x32'8½"	L-13 Operations	Prefabricated Aluminum	16
93 - C	50'x60'	L-13 Maintenance	Steel & Aluminum	14
94 - C	24'x48'8½"	POL Pump House	Prefabricated Aluminum	12
95 - C	4-1000 Bbl	Storage 100 Oct AvGas	Tank-Steel Bolted,Vertical(T-33-36 incl.)	1
95A - C	1-1000 Bbl	Storage, MoGas	Tank-Steel Bolted,Vertical (T-28)	12
	4-10,000 Gal.	Storage, 91 Oct AvGas	Tank-Steel Bolted,Horizontal(T-29-30)	12
96 - C	2-1000 Bbl	Storage, JP1, Fuel	Tank-Steel Bolted,Vertical(T37 & T43)	12
96A - C	4-10,000 Gal.	Storage, Diesel Fuel	Tank-Steel Bolted,Horizontal(T39-42)	12
	1-1000 Bbl.	Storage, Diesel	Tank-Steel Bolted, Vertical (T-38)	12
97 - M		AACS Supply Whse. and Radio Maintenance	(Demolished)	
98 - M		Warehouse	Demolished	
99 - M	20'x56'	Warehouse	Quonset	13
100 - M		Warehouse	Demolished	
101 - M		Warehouse	Demolished	
102 - M		Warehouse	Demolished	
103 - M		Warehouse	Demolished	
104 - M		Warehouse	Demolished	
105 - M		Warehouse	Demolished	
106 - M		Warehouse	Demolished	
107 - M	2-1000 Bbl	Storage, Fresh Water	2-Tanks, Steel, Bolted, Vertical	
107 - C	3-1000 Bbl	Storage, Fresh Water	3-Redwood Stave, Vertical	
108- C	712 Man	Open Air Theater	Proj. Booth, Stage & Seats Wood	5
			Screen Transite	4
109 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	2
110 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	2
111 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	2
112 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	2
113 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	4

[redacted]

135 - M		Auxiliary Equip. Storage	[redacted] (Demolished)	
136 - M			Slab	3
137 - M		Magazine	[redacted] (Demolished)	
138 - M	20'x80'	AF Auxiliary Power	Galv. Iron Shelter	12
139	20'x48'	Weather Station	Concrete Slab w/8 Man Tent	18
140 - C	59'x64'	Cargo Pier W/Approach Dock 20'x35'3"	Timber Construction	12
141	5'x20'	Storage Sheds	3-Sided Wood Shelters	1
142 - C	16'x80'	Personnel Pier	Wood on Wood Piling	1
143 - M	20'x20'	AACS Emergency Power	Wood	16
144 - M	22'x4"x44'4"	Ice Plant	Wood Shelter	3
145	14'x20'x15'	Assigned to Hydrogen Generating Bldg.	Wood, Sheet Metal	18
146 - M		Hut	(Demolished)	
147 - M		Base Flight Maintenance	(Demolished)	
148 - M	13'x13'	Inflation Shelter	Wood	18
149 - M	12'x24'	Shower	4 Man Tent on Larger Slab	18
149A -	4'x4'	Latrine	Wood on Concrete Slab	18
150 - M		AACS UC Storage	[redacted] Slab	
151 - M		AACS UC Storage	[redacted] (Demolished)	
152	8'x16'	Storage Shed	Wood w/Dirt Floor	18
153 - M	20'x25'	Navy Boat Supply	Quonset	12
154 - M	16'x16'x75'	Navigation Tower	Steel	12
155 - M	20'x62'	Small Boat Repair	Quonset	13

BLDG. NO.	SIZE	USE	TYPE	
156 M		HQ, HQ, Squadron	Demolished)	
157 M		Warehouse	(Demolished)	
158 - M	30'x34'	Vehicle Wash Stand	Concrete	13
158A - M	10'x12'	Wash Rack Utility Room	Metal	13
159 - M		Warehouse	(Demolished)	
160 - M		Warehouse	(Demolished)	
161 - M			Slab	13
162 - M	20'x44'	Warehouse	Quonset	9
163 - M	20'x30'	Warehouse	Quonset	9
164		Garbage Ramp	Concrete	17
165 - M	20'x50'	Magazine	Corr. Metal, Earth Covered	15
166 -			Slab	-
167 - M	20'x32'	Utility Operation	Quonset	7
168		Pershing Field, Parade Ground		3
169 - M	20'x36'	H.& N. Maint. Office	Quonset	7
170 - M		Office	(Demolished)	
171		Radar Tower	(Demolished)	
172 - M	8'x12'	Pier Office	Wood	22
173 - M		Dump Master's Shack	Wood (Demolished)	
174 - M	8'x8'x8'	Weather Radar Tower	Wood	16
175 - M	20'x30'	H.& N. Inspector's Off.	Plywood and Metal	7
176	52'x98'	Basketball Court		3
177	30'x80'	Handball Court		3
178				-
179				-
180		Grease Rack	(Demolished)	
181		Truck Loading Rack Sve Station	(Demolished)	
182		Service Station	(Demolished)	
183		Grease Rack	(Demolished)	
184		Acid Tank Building	Wood (Demolished)	
185 -M	12'x12'	Latrine	Wood	14
186 - C	24'x20'8½"	Pump House	Prefabricated Aluminum	5
187 - M				-
188 - M		Monitor Units	(Demolished)	
189 - M		Monitor Units	(Demolished)	
190 - M	8'x12'	Telephone Terminal Building	Wood	16
191 - M		JATO STOR. IGLOO		-
192		Storage	Demolished)	
193 - M		Shed	(Demolished)	
194				-
195				-
196				-
197				-
198				-
199				-
200				-
201-211	16'x32'	Quarters, 8 Man	Tent on Concrete Slab	2
212-217				
218-270	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	2
271-275				
276-280	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	2
281-286				
287-	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	2
293-298				
299-304	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	3
305-310				

BLDG. NO.	SIZE	USE	TYPE	* -
31 16	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	3
317-328				
329-332	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
333-338				
339-342	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
343-348				
349-363	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
364-367				
368-377	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
378-422	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
423-471	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	5
472-476	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	5
477-478	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	5
479-480	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
481-482	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
483	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
484	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
485	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
486	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
487	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
488	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	4
489	14'x15'	Quarters, 4 Man Tents	Tent on Concrete Slab	5
490	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	9
491	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	12
492	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	12
49?	16'x32'	Quarters, 8 Man Tents	Tent on Concrete Slab	12

BLDG. NO.	SIZE	USE	TYPE	
494				
495	16'x32'	Quarters, 8 Man Tent	Tent on Concrete Slab	11
496	16'x32'	Quarters, 8 Man Tent	Tent on Concrete Slab	11
49	16'x32'	Quarters, 8 Man Tent	Tent on Concrete Slab	14
498	16'x32'	Quarters, 8 Man Tent	Tent on Concrete Slab	15
499	20'x24'	Living Quarters	Wood on Concrete Blocks	4
500 - M	53'6"x20'	General Officer Qtrs	"L" shape Wood	3
501 - M	6'x6'	Assigned to Pumphouse (Motor Pool)	Wood	6
502 - M	38'x16'	H.Q. & H.Q. Detachment	Wood	3
502A-		Photo Lab	(Demolished)	
503 - M	126'6"x25'	Motor Pool Repair Shop	Wood and Galv. Metal	6
504 - M	24'x115'	Swimmers Tavern	"L" shape wood & Corr. Transite	
			Corr. Transite & Wood	2
505 - M	66'x32'9"	Duffy's Tavern	Wood	4
505A		Latrine	(Demolished)	
506 - M	48'8"x88'6"	NCO Club	Corr. Transite & Wood	4
506A	10'x18'	Reefer Shelters	Wood Frame - Plywood Siding	4
507 - M			Slab	3
507A - M	48'x20'	Hobby Shop	Wood	3
508 - M	18'x42'	Store Room	Wood Frame Corrugated Metal Siding	3
509 - M	20'x87'	Furniture Repair	Wood	5
510 - M	5'x5'	Telephone Terminal	Metal Cube	12
511 - C	12'x16'	Office	Wood and Aluminum	5
512 - M	12'x12'	Equipment Storage	Wood Frame-Corrugated Metal Cover	7
513 - M	16'x16'	Fire Dept. Stor. Shed	Corr. Metal & Wood	5
514 - M		Woods Athletic Field		5
515 - M	17'8"x48'	Engr. Maint. Office	Wood & Metal	4
516 - M	14'10"x24'10"	Storage for 50 Gal. Drums	2 Concrete Slabs	15
517 M	18'x31'	POL Office	Wood and Transite	12
518 - M	14'10"x24'10"	Storage for 50 Gal Drums	Concrete Slab	15
519 - M	16'x20'	Engineers Paint Shop	Corr. Metal & Screen	7
520 - M	24'8"x10'7" 8'3"x8'7"	Motor Pool Shop Office	Wood, "L" Shape	6
520A - M		Service Station	Wood Bldg. & Gas Pumps	6
521 - M		Grease Rack	Wood	6
522 - M		Skeet Range		15
523 - M	16'x32'	Army Sec. Monitoring U.	Tent	5
524 - M	16'x32'	Army Sec. Monitoring U.	Tent	5
525 - M	16'x32'	Army Sec. Monitoring U.	Tent	5
526 - M	22'x64'	P.X. Warehouse	Prefabricated Aluminum	5
527 - M	12'x24' & 14'x18'	Heavy Equipment Shacks	Wood	5
528 - M	8'x12'	Storage Shed	Wood	6
529 - M	18'x45'	Motor Pool Office	Wood,Wood Flr, No Fndn,Corr.Metal Roof	6
530 - M	16'x35'	Ammo Storage	Quonset	7
531 - M	15'x30'	Sand Blast Shed	Wood & Corrugaged Metal	7
532 - M	8'x12'	Sand Blast Shed	Wood & Corrugated Metal	7
533 - M	8'x8'	Sand Blast Shed	Wood & Corrugated Metal	7
534 - M	25'x25'		Slab	8
535 - M	8'x10'	Ordinance Inspection	Wood	8
536 - M	20'x85'	Engineer Supply Storage	Wood Frame - Canvas Covered	7
537 - M	12'x12'	Office	Wood Frame-Corrugated Metal Cover	7
538 - M	8'x16'	Office	Metal	13
539 - M	12'x16' & 20'x24'	Shed	Metal	13
540 - M	18'x20'	Pump House	Wood w/Metal Roof	13
540A M	12'x12'	Water Tower	Cube on Wood Tower	13

BLDG. NO.	SIZE	USE	TYPE	
541 - M	12'x18'	Shed	Wood Frame - Canvas Cover	13
542 - M	6'x10'	Storage Shed	Wood w/concrete floor	13
54 M	15'x20'	Paint Storage	Metal	12
544	24'x120'	Reefer Shelter	Wood on Elevated Fdn.-Metal Roof	4
545		Generator Shed	Wood with metal roof (Demolished)	
546	12'x20'	Hot Locker Bldg.	Wood Frame w/corrugated metal	4
547	12'x15'	Barber Shop	Wood on Wood Blocks	4
548 - M	8'x16'	Air Force Mail Room	Wood Frame - Corrugated Metal covered	4
549 - M	24'x26'	Air Force Gym	Wood & Corr. Metal, Wood Floor	4
550				
551 - M	16'x34'	Storage	Wood & Corrugated Metal	12
552	8'x32'	Tool Shed	Wood & Corr. Metal on Skids	12
553	20'x25'		Concrete Slab	14
554	15'x25'	Sand Blast Pad	2 Sided Wood Wall - Metal Roof	15
555	12'x12'		Slab	15
556	200'x300'	Jet Warm Up Pad	Concrete Slab	13
557	135'x260'	Decontamination Pad	Concrete Slab	15
558	100'x150'	Decontamination Pad	Concrete Slab	15
559	32'x50'	Jet Deflector Pad	Concrete Pad	15
560				-
561 - C	5000 bbl	Storage Av-Gas	Tank, Steel, Welded, Vertical (T-1)	12
562 - C	5000 bbl	Storage, Jet Fuel	Tank, Steel, Welded, Vertical (T-2)	12
563 - C	10,000 bbl	Storage, Av. Gas	Tank, Steel, Welded, Vertical (T-3)	12
564 - C	10,000 bbl	Storage, Jet Fuel	Tank, Steel, Welded, Vertical (T-4)	12
565				-
566				-
567				-
56				
569 - C		Av-Gas Fill Stand	Steel Platform - Concrete Pad	15
570 - C		Av-Gas Fill Stand	Steel Platform - Concrete Pad	15
571 - C		Mo-Gas Fill Stand	Steel Platform - Concrete Pad	12
572		F. W. Tank		15
573				-
574				-
575				-
576				-
577				-
578				-
579				-
580				-
581				-
582				-
583				-
584				-
585				-
586				-
587				-
588				-
589				-
590				-
591				-
592				-
593				-
594				-
595				-
596				-
597				-

BLDG NO.	SIZE	USE	TYPE	
59				-
59				-
600 - C	80'x120'	Warehouse	(2) Butler Type	13
601 -				
602 - C	40'x120'	Warehouse	Prefabricated Steel	7
603 - C	51'x102'	Special Services	Prefabricated Aluminum	3
	51'x128'	In "L" Shape	Prefabricated Aluminum	3
604 - M	20'x48'	Electronics Maintenance	Prefabricated Steel	12
605 - M	20'x48'	Electronics Maintenance	Prefabricated Steel	12
606 - M	20'x48'	Tech. Supply & Inspect.	Wood	12
607 - M	20'x48'	Air Weather Service	Prefabricated Steel	9
608 - M	20'x48'	Air Weather Service	Prefabricated Steel	9
609 - M	20'x48'	Air Weather Service	Prefabricated Steel	9
610 - M	20'x48'	Photo Laboratory	Prefabricated Steel	12
611 - M	20'x48'	Line Maintenance	Wood	12
612 - M	20'x48'	Supply	Prefabricated Steel	9
613 - M	20'x48'	Supply	Prefabricated Steel	9
614 - M	20'x48'	Depot Supply	Prefabricated Steel	7
615 - M	20'x48'	Depot Supply	Prefabricated Steel	7
616 - M	20'x48'	Mess Hall Storage	Prefabricated Steel	4
617 - M		Gear Loft	(Demolished)	
618 - M	20'x48'	AG Office	Prefabricated Steel	3
619 - M	20'x48'	Special Ser. Whse.	Prefabricated Steel	3
620 - M	20'x48'	Ordnance Maintenance	Prefabricated Steel	8
621 -	16'x16'	Radar Tower	Steel	16
622 - M	20'x48'		Slab	8
623			(Demolished)	10
624 - M	7'x32'	storage	Wood	9
625 - M	20'x100'		Slab	9
626 - M	40'x40'		Slab	9
627 - M	20'x35'		Slab	9
628 - C	10x13'x8'	25-Man Latrine	Wood	14
629 -	20'x20'8½"	Storm Detection Radar	Pacific Bldg. (Esp. Const.)	16
630 - M	20'x72'	Parachute Repack Bldg.	Prefabricated Steel	12
631 - M	24'x20'	Carpenter Shop	Prefabricated Steel	12
632 - M	20'x48'	WRECEP Personal Equipment (A.F. Whse.)	Wood	9
633 - M	20'x48'	Aircraft Parts	Wood	12
634 - M	20'x48'	Navy Operations	Wood	14
635 - M	20'x48'	Navy Operations	Wood	14
636 - M	20'x48'	Navy Operations	Wood	14
637 - M	20'x48'	AF Personal Gear Storage	Wood	13
638 - M	12-20'x48'	Supply Warehouse	Wood	9
639 - M	16'x16'x35'	Parachute Drying Tower and Boiler House	Wood	12
640 - M	20'x48'	A.E.C. Warehouse	Prefabricated Steel	12
641 - C	120'x120'	Q.M. Non-expendable Whse	Prefabricated Steel	7
642 - C	80'x120'	Ordnance Whse	Prefabricated Steel	8
643 - C	80'x120'	Q.M. Expendable Whse	Prefabricated Steel	7
644 - C	40'x120'	Q.M. Sales	Prefabridated Steel	7
645 - C	40'x101'x16'	T.C. Gear Loft & Security Storage		12
646 -	40'x101'	Aircraft Engine Bldg. & Storage	Prefabricated Steel	12
647 - C	24'x80'	M.P. Hdqtrs	Prefabricated Alum	4
648 - C	78'x120'	Warehouse (AF Supply)	Prefabricated Steel	13

64

B[illegible] NO.	SIZE	USE	TYPE	*
649 - C	78'4"x120'	Warehouse (AF Supply)	Prefabricated Steel	13
650 - C	38'4"x120'	Warehouse (AF Supply)	Prefabricated Steel	13
651 - C	38'4"x100'	Equip. & Storage Bldg.	Prefabricated Steel	12
652 - M	20'x48'	Radio Station WXLE	Prefabricated Steel	3
653				-
654	24'x128'8½"	Assigned to 40-Man Bks.	Aluminum (Not built)	-
655				-
656				-
657				-
658	24'x128'8½"	Assigned to 40-Man Bks.	Aluminum (Not Built)	-
659	24'x128'8½"	Assigned to 40-Man Bks.	Aluminum (Not Built)	-
660 - M	20'4¼"x48'4¼"	RAWINSONDE	Prefab. Steel (Weather Detach.)	18
661 - C	25'2"x85'10½"	Eng. Equip. Bldg. & Main.Shop	Prefabricated Aluminum	5
662	24'x148'8½"	Assigned to 48-Man Barracks	Prefabricated Aluminum (Not Built)	-
663 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	2
664 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	2
665 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	2
666 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	2
667 - C	24'x148'8½"	44-Man Barracks w/latrine	Prefabricated Aluminum	3
668 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	2
669 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	4
670 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	4
671 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	4
672 - C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	4
67[illegible] C	24'x148'8½"	48-Man Barracks	Prefabricated Aluminum	5
674 - C	15'x20'	Welding Shed	Wood Frame - Conc. Floor	5
675 - M	24'x48'	C.G. Quarters & Storage	Prefabricated Aluminum	1
676 - C	46'x90'	Guest House	Wood Frame	3
677 - M	42'x100'	Swimming Pool	Concrete	1
678 - C	33'x80' L Shape 24'x33'	Chapel	Wood	3
679 - C	121'2"x161'2"	Operations & Admin.	Prefabricated Steel	12
680 - M	10'x12'	Pump House (Swimming Pool)		1
681 - C	19'x48'	Electronics & Com. Bldg.	Prefabricated Steel	12
682 - C	24'x72'	Consolid. Shop	Prefabricated Aluminum	8
683 - C	48'x100'	" "	Prefabricated Steel	7
684 - C	40'x120'	" "	Prefabricated Steel	8
685 - C	24'x38'7½",50'6"x72'	Crash Fire Sta.	Prefab. Aluminum P.I.&.E.	7
686 - M	48'x104'	T.G. 7.1 Lab. Bldg.	Prefabricated Steel	15
687 - M	48'x104'	T.G. 7.1 Admin. Bldg.	Prefabricated Steel	15
688		Assigned to T.G. 7.1 Bldg.	(Not built)	-
689				-
690				-
691				-
692				-

BLDG NO.	SIZE	USE	TYPE	*
700 - M	16'x32'	Quarters - 8 Man Tent	Tent on Concrete Slab	15
701 - M	16'x32'	Quarters - 8 Man Tent	Tent on Concrete Slab	15
702 - M	16'x32'	Quarters - 8 Man Tent	Tent on Concrete Slab	16
703 - M	16'x32'	Quarters - 8 Man Tent	Tent on Concrete Slab	16
704 - M	16'x32'	Quarters - 8 Man Tent	Tent on Concrete Slab	88

~~OFFICIAL USE ONLY~~

SITE DAVID

BUILDING & STRUCTURE NUMBERS

HOLMES & NARVER, INC.

REVISED TO 1 OCT. 1956

MISC. 427

NOTE: Any corrections or changes to this list should be made only on the master list which is maintained in the Office Engineering Section, Engineering Division.

GENERAL NOTES

1. For further information on other available types of buildings refer to the ALL-BUILT Drawings.

2. Subject is divided by an asterisk symbol (*) which separates General Legend (working drawings of [illegible] buildings types on the left [illegible]

3. The buildings [illegible] Plans, General Legends and Drawings.

4. Symbol [illegible] buildings [illegible] available [illegible]

5. Symbol [illegible] buildings [illegible] or [illegible]

BLDG. NO.	SIZE	USE	TYPE
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			

Bldg No.	Size	Use	Type	
51				
52				
53				
54				
55				
56				
57				
58				
59				
60				
61				
62				
63				
64				
65				
66				
67				
68				
69				
70				
71				
72				
73				
74				
75				
76				
77				
78				
79				
80				
81				
82				
83				
84				
85				
86				
87				
88				
89	[illegible]	[illegible]		[illegible]
90	[illegible]	[illegible]	Wood	2
91	[illegible]	[illegible]	Wood	2
92	[illegible]	[illegible]	Wood & Corr. Metal Roof	2
93	[illegible]	[illegible]	Wood & Corr. Metal Roof	2
94	[illegible]	[illegible]	Wood & Corr. Metal Roof	2
95	[illegible]	[illegible]		[illegible]
96	[illegible]	[illegible]		[illegible]
97	[illegible]	[illegible]		[illegible]
98	[illegible]	[illegible]	Wood	1
99	[illegible]	[illegible]		2
100		[illegible]	Steel Tank	1

Item No.	Date	Ref	Title	*
101 - [illegible]	[illegible]	[illegible]	[illegible]	1
104 - [illegible]	[illegible]	[illegible]	[illegible]	1
104		[illegible]	[illegible]	
105	[illegible]		[illegible]	1
106 - [illegible]	[illegible]	[illegible]	[illegible]	1
107	[illegible]	[illegible]	[illegible]	1
108	[illegible]		[illegible]	1
109			[illegible]	
110 - [illegible]	[illegible]	[illegible]	[illegible]	
		[illegible]	[illegible]	1
111			[illegible]	
112	[illegible]		[illegible]	1
113	[illegible]		[illegible]	1
114		[illegible]	[illegible]	
115	[illegible]	[illegible]	[illegible]	1
116		[illegible]	[illegible]	
117		[illegible]	[illegible]	
118		[illegible]	[illegible]	
119	[illegible]	[illegible]	[illegible]	1
120	[illegible]	[illegible]	[illegible]	1
121	[illegible]	[illegible]	[illegible]	1
122	[illegible]	[illegible]	[illegible]	1
123	[illegible]	[illegible]	[illegible]	1
124	[illegible]	[illegible]	[illegible]	1
125	[illegible]	[illegible]	[illegible]	1
126		[illegible]	[illegible]	
127	[illegible]	[illegible]	[illegible]	1
128	[illegible]	[illegible]	[illegible]	1
129	[illegible]	[illegible]	[illegible]	1
130	[illegible]	[illegible]	[illegible]	1
131	[illegible]	[illegible]	[illegible]	1
132	[illegible]	[illegible]	[illegible]	1
133	[illegible]	[illegible]	[illegible]	1
134	[illegible]	[illegible]	[illegible]	1
135	[illegible]	[illegible]	[illegible]	1
136	[illegible]	[illegible]	[illegible]	1
137	[illegible]	[illegible]	[illegible]	1
138		[illegible]	[illegible]	
139	[illegible]	[illegible]	[illegible]	1
140	[illegible]	[illegible]	[illegible]	1
141	[illegible]	[illegible]	[illegible]	1
142	[illegible]	[illegible]	[illegible]	1
143	[illegible]	[illegible]	[illegible]	1
144	[illegible]	[illegible]	[illegible]	1
145	[illegible]	[illegible]	[illegible]	1
146	[illegible]	[illegible]	[illegible]	1
147	[illegible]	[illegible]	[illegible]	1
148			[illegible]	
149			[illegible]	
150	[illegible]	[illegible]	[illegible]	1

[illegible]	SIZE	USE	TYPE	
[illegible]	10'x15'		Concrete Slab	1
[illegible]	[illegible]		Concrete Slab	1
[illegible]	10'x30'		Concrete Slab	1
[illegible]	10'x30'		Concrete Slab	1
[illegible]	10'x30'		Concrete Slab	1
[illegible]			Demolished	
[illegible]	[illegible]	Shed	Demolished	
[illegible]			Wood	1
[illegible]	20'x20'		Demolished	
160	[illegible]	Concrete Slab [illegible]	Concrete Slab	2
161			Concrete Slab	1
[illegible]			Demolished	
[illegible]	20'x15'		Demolished	
[illegible]			Concrete Slab	1
[illegible]	20'x20'		Demolished	
[illegible]	[illegible]	Powder Magazine	Buried Quonset	3
[illegible]	20'x20'	Powder Magazine	Buried Quonset	3
[illegible]	20'x20'	Powder Magazine	Buried Quonset	3
[illegible]	15'x[illegible]		Concrete Slab	1
[illegible]	[illegible]		Concrete Slab	1
[illegible]			Demolished	
[illegible]			Demolished	
[illegible] - C			Demolished	
[illegible]	[illegible]	Garage	Wood Frame, Corr. Alum.	1
[illegible]	8'x11'		Concrete Slab	1
176			Demolished	
177			Demolished	
178	[illegible]	Shed	Concrete Slab	1
179	[illegible]	Shed	Concrete Slab	1
180 - C	10'x12'	Shed	Concrete Slab	1
[illegible]	20'x20'	[illegible] (Old Shed)	Wood Frame, Corr. Alum. [illegible]	2
182				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				

~~OFFICIAL USE ONLY~~

SITE ELMER

BUILDING & STRUCTURE NUMBERS

HOLMES & NARVER, INC.

REVISED TO 1 OCT 1956

MISC. 416

NOTE: Any corrections or changes to this list should be made only on the master list which is maintained in the Office Engineering & Design Department of the Engineering Division.

~~OFFICIAL USE ONLY~~

GENERAL NOTES

1. For further information on sizes and types of buildings, refer to the As-built floor plans.

*2. Column denoted by an asterisk contains numbers which represent General Layout Drawing Number or area in which building appears on the new 1" = 200' topographic sheets.

3. The building numbers in this index correspond to Bolmar & Murray Plans, General Layout and Survey Index.

4. Symbol beside building number (M) indicates Military owned building or structure.

5. Symbol beside building (C) indicates Civil owned building or structure that is unfinished, e.g. (C) Building-Work-In-In-Progress.

USE	BLDG. NO.
AC Bldg., CM	333
Acetylene Storage	258
AEC Administration	209
AEC Motor Pool Bldg.	189
Announcers Booth	251 & 199
Assembly Building	411
Backstop	250
Bakery	202
Barge Slip, "U"	419
Baseball Field	199
Battery & Tire Shop	168
Beach Club (Riviera)	190
Beach Clubs (Lagoon - Miramar)	151-152
BIO-MED Building	218
Boc'n's Locker	174
Boiler House	203
Boiler House	301-301A
Boiler House	303
Boiler House	513
Bulk Storage Whse	516
Camp Office	178
Carpenter Shop	317
Carpenter Shop	427
Cement Storage Whse	420
Chapel	175 & 242
Chill Storage	238
Commissary	230
Commissary Office	219
Communications Bldg.	229
Control Building	311
Counting & Sampling Lab.	212A
Counting & Sampling Lab.	212B
Counting & Sampling Lab.	212C
Cylinder Racks	345A &B
Cylinder Shelters	340A to H
Day Room & Library	216
Decon. Area	249
Decon. Building	143
Deep Water Pier	142
Dentist Office	118
Diesel Storage	371-375
Diesel Storage	380
Diesel Storage	381
Diesel Storage	382
Diesel Storage (Barge)	192
Distillation Plant	513
Distillation Main. Bldg.	514
DUKW, Meter Repair	322
DUKW Repair Shelter	360

USE	BLDG. NO.
Elec. Overhaul & Shops	310
Electrical Repair Shop	315
Elevated Water Storage (Irrig.)	220
Elevated Water Storage (Salt)	349
Eng. Equip. Storage	226 & 241
Equipment Room	194-A
Fire Sta. & Quarters	205
Freight Cargo Pier	137
Fresh Water Storage	312
Fresh Water Storage	326
Galley	201
Garbage Building	254
Garbage Can Building	150
Gasoline Storage	376-379
Grease Rack	191
Guard & Const. Office	177
Guardhouse, Assly. Area	414
Guard Post	213-214
Guard Post	332
Guard Shack	408
Guard Shelter (CWS)	362
Guard Tower	335-336
Gymnasium	179 - 244
Heavy Equipment	188
Heavy Equipment Machine Shop	405
Heavy Equipment Repair	421
Heavy Equipment Repair Shop	404
Heavy Equipment Shops	430
H.E. Riggers Loft	181
High Explosives Building	412
Hobby Shop	176 - 243
H&N Administration	208
H&N Administration	208A
H&N Motor Pool Bldg.	188
H&N Personnel	208B
Infirmary	117
Instrument Laboratory	211
Iron Workers Shed	399
JTF Recreation	432
Laboratory	223
Laboratory	231
Laboratory	329
Laboratory	330
Laboratory	344
Lab. Material Testing	309
Lanai	320
Latrine	165

USE	BLDG. NO.
Latrine (Ball Park)	240
Latrine & Showers	227-228
Latrine & Showers	233-236
Latrine (Mess Hall)	215
Latrine (100 Man)	680-684
Latrine, Warehouse Area	551
Latrine, Warehouse Area	552
Laundry	302
Lubrication Rack	167
Machine Shop	426
Magazine	351
Magazine	413
Magazine	415
Marine Elect. & Injector Shop	184
Marine Injector Shop	325
Marine Operations	406
Marine Welding Shop	429
Materials Testing Lab.	309
Mess Hall, 3 Wing	201
Mill & Saw Shed	186 & 428
Mogas Storage	383
Mogas Storage	384
Motor Pool Ad.	189
Motor Pool Hq.	188
M-Boat Ramp	138
M-Boat Ramp	139
M.P. Guards Tent	239
Nitrogen Storage	257
Nurses Quarters & Dentist	118
Operations Building	164
Oxygen Tabernacle	422
Paint Shop	424
Paint Shop & Parts Warehouse	401
Paint Storage	425
Pass & Badge Office	222
Personnel Pier	140
Photo Laboratory	210
Pier, Deep Water	142
Pier, Freight Cargo	137
Pier, Personnel	140
Pier, Guard Shelter	187
Plumbing & Refrigeration	314
PO, PX, & Snack Bar	204
POL Pump House	300
Power Plant	339
Power & Distillation Plant	301-301A-301B
Pump House	162

USE	BLDG. NO.
Quarters, 4 Man	120
Quarters, 8 Man (Tent)	51-99A
Quarters, 8 Man (Tent)	99B-99H
Quarters, 18 Man	111-114
Quarters, 18 Man	115-116
Quarters, 18 Man	119
Quarters, 18 Man	121-130
Quarters, 4 Man (Tent)	1-50
Quarters, 36 Man	131-134
Quarters, 36 Man	206
Quarters, 36 Man	100-110
Quarters, 48 Man	135-136
Quarters, 48 Man	680-684
Quarters, 36 Man	144
Quarters, 8 Man	600-671
Quarters, 8 Man	145-146
Radio Repair Shop	180
Radsafe Building	323
Radsafe Hutment	324
Rank Diesel Storage	192
Receiving & Classified Mail	515
Recreation Bldg	185
Recreation Bldg	237
Reefer	217
Reefer Banks	196
Reefer Banks	197
Refrigeration Shop	316
Refreshment Bldg.	409
Refreshment Stand	252
Reservoir (2 Sections)	166
Salt Water Intake	347-A
Salt Water Intake	347-B
Salt Water Pump House	410
Saw Mill	428
Scientific User Bldg	232
Scullery	201
Security Office	222
Sheet Metal Shop	314A
Shelter	331
Shelter	334
Skeet Range	141
Shop	342
Shop & Laboratory	418
Shop and Storage	341
Shop with Dehumidifying	194
Steam Cleaning for Marine Depot Bldg	322A
Stock Building	299
Storage Tent, Tire Equipment	207
Storage Building (OMR)	350
Storage (Proposed)	245
Supply Dev. Off. & Store	313

USE	BLDG NO.
Tank (Water)	220
Task Force H	221
Telemeter & Receiver Building	229
Television Center	338
Test Shelter (Aerial Cargo)	193
Theater, open air	200
Tire Equip. Storage	207
Tower	406
Typewriter Repair Shop	318
Warehouse	319
Warehouse	320
Warehouse, Aux.	511
Warehouse, Aux.	512
Warehouse, Bulk Storage	516
Warehouse, Camp Supplies	507
Warehouse, Dry Stores	504
Warehouse, Electrical	501
Warehouse, Food	308
Warehouse, General Stores	509
Warehouse, Heavy Duty Parts	505
Warehouse, Plumbing	502
Warehouse, Property	508
Warehouse, Rec. & Class.	515
Warehouse, Ref. Marine & Power	506
Warehouse, Shipping	503
Warehouse, Tool Crib & Sta. Issue	510
Water Storage - Elevated	220 & 345
Water Storage, Press	312 & 326

~~OFFICIAL USE ONLY~~

SITE SUMMARY

BLDG. NO.	SIZE	USE	TYPE	*
1-50 -	14'2"x14'4"	Quarters, 4 Man	Tent on Concrete Slab	5
51-82 -	15'10"x31'10"	Quarters, 8 Man	Tent on Concrete Slab	5
83-99A -	15'10"x31'10"	Quarters, 8 Man	Tent on Concrete Slab	7
99B-99H - M	15'10"x31'10"	Quarters, 8 Man	Tent on Concrete Slab	5
100-110 - C	24'x128'8½"	Quarters, 36 Man	Prefabricated Aluminum	3
111-114-C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
115-116 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
117 - C	24'x92'8½"	Infirmary	Prefabricated Aluminum	3
118 - C	24'x44'8½"	Nurses Quarters & Dentist	Prefabricated Aluminum	3
119 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
120 - C	24'x68'8½"	Quarters & Lanai	Prefabricated Aluminum	3
	58'8"x20'8"	Lanai	Wood	3
121 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
122-130 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	5
131-132 - C	24'x68'8½"	Quarters, 18 Man	Prefabricated Aluminum	3
133 - C	24'x128'8½"	Quarters, 36 Man	Prefabricated Aluminum	1
134 - C	24'x128'8½"	Quarters, 36 Man	Prefabricated Aluminum	1
135 - C	24'x168'8½"	Quarters, 48 Man w/Latrine	Prefabricated Aluminum	3
136 - C	24'x168'8½"	Quarters, 48 Man w/Latrine	Prefabricated Aluminum	3
137 - C	40'x180'	Freight Cargo Pier	Concrete - Steel - Wood	4
138 - C	50'x180'	LCM-Boat Ramp	Concrete	6
139 - C	50'x85'	LCM-Boat Ramp	Concrete	6
140 - C	30'x200'	Personnel Pier	Wood	8
141 - C		Skeet Range		7
142 - C		Deep Water and LST Pier	Wood on Steel Frame	2
143	38'x63'	36-Man Decontamination	Tents on Slab	8
144	24'x128'8½"	Assigned to Quarters, 36 Man	Prefabricated Aluminum	3
145	24'x128'8½"	Assigned to Quarters, 36 Man	Prefabricated Aluminum	3
146	16'x32'	Quarters, 8 Man	Tent on Concrete Slab	5
147	16'x32'	Quarters, 8 Man	Tent on Concrete Slab	4
148 - C	32'x60'	Volley Ball Court	Compacted Coral	3
149	14'2"x14'4"	Crew Chief Shelter	Tent (Type A)	8
150 - C	10'7"x10'10"	Garbage Can Building	Wood w/Concrete Floor	3
151 - C	32'x47'	Beach Club	Wood on Concrete Floor	6
151A	32'x47'	Life Guard Tower	Wood on Concrete Floor	8
152 - C	32'x47'	Life Guard Tower	Wood on Concrete Floor	8
153-158		[illegible]	Demolished	
159 - C	4'x20'	Gasoline Filling [illegible]	Pumps, Tanks & Concrete Slab	2
160-161		[illegible]	Demolished	
162 - C	10'x12'	[illegible]	Wood on Concrete Floor	2
163				
164 - C	16'x30'	Operations Bldg. (Air Traffic)	Wood & Aluminum on Conc. Floor	8
165 - C	10'x12'	Latrine	Wood on Concrete Floor	4
166	51'x6"x52'3"	Reservoir - Fresh Water Storage	Concrete, partly underground	4
167 - C	6'x24'	Lubrication Pit	Concrete	4
168 - C	10'8"x13'6"	Battery & Tire Shop	Wood	4
	30'x50'			4
	38'x42'			
169 - C	32'x60'	Volley Ball Court	Compacted Coral	3
170A - C	32'x60'	Volley Ball Court	Compacted Coral	3
170B - C	32'x60'	Volley Ball Court	Compacted Coral	3
171 - C	30'x63'	Handball Court	Wood & Concrete Slab	3
172 - C	32'x100'	Tennis Court	Bituminous Paving	3

BLDG. NO.	SIZE	USE	TYP.
173 - C	32'x60'	Volley Ball Court	
174A - C	12'x12'x8'	Marine Ways Shed	Wood Frame, Plywood Siding
174B - C	12'x12'x8'	Marine Ways Shed	Wood Frame, Plywood Siding
174C - C	8'x10'x8'	Marine Ways Shed	Wood Frame, Plywood Siding
174 - C	20'x56'	Boat'n's Locker	Quonset
175 - C	20'x56'	Chapel	Quonset
176 - C	20'x56'	Hobby Shop	Quonset
177 - C	20'x56'	Guard & Const. Office	Quonset
178 - C	20'x56'	Camp Office	Quonset
179 - C	20'x56'	Gymnasium	Quonset
180 - C	20'x56'	Radio Repair Shop	Quonset
181 - C	20'x56'	U.S. Riggers Loft	Quonset
182		Supply Hardware Whse	(Demolished)
183		Beer & Elect.Eqmt. Whse	(Demolished)
184 - C		Marine Elect. & Inj. Mtr. Shop	Jumbo Quonset
185 - C	20'x56'	Recreation Bldg.	Quonset
186 - C	20'x30'	Mill & Saw Shed	Wooden Shelter
187 - C	8'x12'	Pier Guard Shelter	Wood
188 - C	10'x12'	H&N Motor Pool Dispatcher Heavy Equipment	Wood
189		ABC Motor Pool Dispatcher	(Demolished)
190 - C	32'x50'	Beach Club (Riviera)	Wood w/Concrete Floor
190A		Life Guard Tower	Wood
191	39'x16'	Timber Grease Rack	Wood
192 - C	7'x18'	Tank, Diesel Storage	Marine Steel, Welded Horiz 5000 Gallon
193	11'x12'	Admin. Compound Test Shelter	Wood
194 - C	24'x60'8½"	Shop with Dehumid Eq	Prefabricated Aluminum
194A - C	15'2"x37'	Equipment Room	Wood
195		Shoe Shop	RAZED
196	21'4"x90'5"	Reefer Banks	Wood & Canvas Shelters
197	23'10"x80'6"	Reefer Banks	Wood & Canvas Shelters
198		Marine Electric Shop	RAZED
199 - C		Cooper Baseball Field & Announcer's Booth	Wood
200 - C	1350 Man	Theater, open air	Wood and Alum., Proj. Room Shelter, Seats, Stage & Screen
201 - C	3 - 24'x104'8½" 1 - 24'x84'8½"	Mess Hall, 3 wings	Prefabricated Aluminum
	24'x26'	Scullery	
	24'x110'8½"	Galley	
	24'x38'	Galley	
	24'x38'	Galley	
202 - C	24'x48'8½"	Bakery	Prefabricated Aluminum
203 - C	24'x24'8½"	Boiler House	Prefabricated Aluminum
204 - C	24'x128'8½"	PC, PA & Snack Bar	Prefabricated Aluminum
205 - C	24'x52'8½"	Fire Sta. & Quarters	Prefabricated Aluminum
206 - C	24'x128'8½"	Barracks, 36 Men	Prefabricated Aluminum

BLDG. NO.	SIZE	USE	TYPE	
207		Storage Tent, Fire Equipment	(Demolished)	
208 C	24'x105'8½"	H&N Administration	"L" Shape, Prefabricated Aluminum	5
	24'x60'			5
208A - C	24'x24'8½"	H&N Administration	Prefabricated Aluminum	5
208B - C	24'x64'8½"	H&N Personnel	Prefabricated Aluminum	5
209 - C	24'x124'8½"	AEC Administration	Prefabricated Aluminum	5
	24'x118'8½"	"T" Shape	Prefabricated Aluminum	5
210 - C	24'x88'8½"	Photo Laboratory	Prefabricated Aluminum	5
211 - C	24'x128'8½"	Instrument Laboratory	Prefabricated Aluminum	5
	24'x74'8½"	Instrument Laboratory	Prefabricated Aluminum	5
212A - C	24'x16'8½"	Counting & Sampling Lab	Prefabricated Aluminum	5
212B - C	24'x24'8½"	Counting & Sampling Lab	Prefabricated Aluminum	5
212C - C	7'4"x7'4"	Counting & Sampling Lab	Wood Frame, Earth Covered	5
213 - C	4'x4'	Guard Post (Adm Comp.)	Wood	5
214 - C	4'x4'	Guard Post (Adm Comp.)	Wood	3
215 - C	9'x12'	Latrine (Mess Hall)	Prefabricated Aluminum	3
216 - C	24'x72'8½"	Day Room & Library	Prefabricated Aluminum	3
217 - C	24'x156'8½"	Roofer	Prefabricated Aluminum on Elevated Slab	3
218 - C	24'x36'8½"	BIO-MED. Building	Prefabricated Aluminum	9
219 - C	10'x10'2"	Commissary Office	Wood Frame, Wood Floor & Aluminum Roof	3
220 - C	27'x52'	Elevated Water Storage	50' Timber Tower	3
	1000 Bbl	Tank	Bolted Steel, Vertical	3
	500 Bbl	Tank	Bolted Steel, Vertical	3
221 - C	24'x158'8½"	Tank Force Main	"L" Shape, Prefab Aluminum	
	3-24'x106'8½"		with 3 wings	5
222 C	24'x72'8½"	Pass & Badge Office	Prefabricated Aluminum	5
223 - C	24'x160'	Laboratory	Prefabricated Aluminum	5
224		Assigned to Communications Bldg.		5
225	16'x20'	Assigned to TV Film Process Lab.	Concrete Blocks	1
226	12'x14'	Radio Shop. Storage	Plywood - Wood Frame & Floor	1
227 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	6
228 - C	24'x36'8½"	Latrine & Showers	Prefabricated Aluminum	6
229 - C	24'x12'8½"	Survey Field Office	Prefabricated Aluminum	1
230 - C	24'x68'8½"	Commissary	Prefabricated Aluminum	3
231 - C	24'x28'8½"	Laboratory	Prefabricated Aluminum	5
232 - C	24'x56'8½"	Scientific User Shop	Prefabricated Aluminum	5
233 - 234	25'x36'	Latrine & Showers	Wood & Aluminum	6
235 - 236	25'x36'	Latrine & Showers	Wood & Aluminum	7
237 - C	24'x144'8½"	Recreation Building	Prefabricated Aluminum	3
238 - C	24'x48'	Shell Storage	Concrete Block	3
239	16'x32'	Main Guards Tent	6-Man Tent on Conc. Slab	4
240 - C	4'6"x8'	Latrine (Ballpark)	Wood Frame - Conc. Slab	4
241 - C	28'x30'	Add. to Film Station #2	Prefabricated Aluminum	4
242 - C	25'x48'	Chapel	Wood	3
	18'x25'			
243	24'x60'	Assigned to Hobby Shop	Prefabricated Aluminum	6
244	24'x60'	Assigned to Gymnasium	Prefabricated Aluminum	6
245	24'x50'	Assigned to Ventilated Storage Bldg.		3
246	16'x32'		Tent on Conc. Slab	4
247	16'x32'		Tent on Conc. Slab	4
248	90'x100'	Tractor Repair Yard	Earth	4
249 - C	150'x300'	Recor. Area	Trailer Shed & Slab - Fenced	7

BLDG. NO.	SIZE	US	TYPE	
250 - C		Backstop & Locke Field	Wood & Wire, Locke Field	7
25[illegible] C	10'x10'	Announcers Booth	Wood, Locke Field	7
252 - C	25'x25'	Refreshment Stand	Wood, Lock Field	7
253 - C	8'x10'	Incinerator	Brick & Conc. Fenced	5
254 - C	10'7"x20'	Garbage Building	Wood, one Concrete w/Ramp	3
255	8'x12'	Acid House	Wood	4
256	10'x20'	Beach Combers Shack	Wood Frame, Corr. Metal Siding	5
257 - C	12'x12'	Nitrogen Storage	Canvas, on Wood Frame	1
258 -	24'x50'	Acetylene Storage	Canvas, on Wood Frame	1
259	9'x10'	Storage Shed	Wood	1
260	16'x32'	Scientific Tent	Tent on Coral Floor	1
261	16'x32'	Scientific Tent	Tent on Conc. Slab	1
262	16'x32'	Scientific Tent	Tent on Conc. Slab	1
263	16'x32'	Scientific Tent	Tent on Conc. Slab	1
264	10'x24'	Generator House	Wood Frame, Corr. Metal Siding	1
265	12'x15'	A.E.C. Motor Pool Dispatcher	Prefabricated Aluminum	3
266	10'x17'	Compressor Shed	Wood, Corr. Metal Roof, Dirt Floor	4
267	20'x20'	Vehicle Cleaning	Slab	4
268	10'x13'	Boiler House	Wood, Corr. Metal Roof, Conc. Floor	4
269	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
270	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
271	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
272	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
273	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
274	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
275	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
276	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
277	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
278	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
279	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
280	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
281	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
282	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
283	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
284	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
285	16'x32'	Scientific, 8 Man	Tent on Conc. Slab	5
286	6'x8'	Storage Shed	Plywood Panel	5
287	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	6
288 - C	40'x40'	Volley Ball Court	Compacted Coral	6
289 - C	40'x60'	Volley Ball Court	Compacted Coral	6
290 - C	40'x60'	Volley Ball Court	Compacted Coral	7
291	17'x32'	Steel Shed	Wood & Canvas Roof	6
292	14'x23'	Welders Shed	Wood and Canvas, Dirt Floor	6
293 - C	6'x52'	Shuffle Board Court	Conc.	6
294 - C	6'x52'	Shuffle Board Court	Conc.	8
295 - C	6'x52'	Shuffle Board Court	Conc.	8
296 - C	6'x52'	Shuffle Board Court	Conc.	11
297	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	7

BLDG. NO.	SIZE	USE	TYPE	
298	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	7
299 - C	40'x101'7"	Steel Bldg.	Butler type, Aluminum	4
300 - C	24'x32'8½"	POL Pump House	Prefabricated Aluminum	2
301 - C	52'x105'6½"	Power & Distill. Plant	Prefab Alum. & Reinf. Concrete	4
301A - C	24'x24'8½"	Boiler House	Prefabricated Aluminum	4
301B		Shelter for additional unit:	(Demolished)	
302 - C	24'x144'8½" 24'x42'8½"	Laundry	Prefabricated Aluminum	4
303 - C	24'x24'8½"	Boiler House	Prefabricated Aluminum	4
304		Diesel Storage	(Demolished)	
305		Diesel Storage	(Demolished)	
306	16'x32'	Storage	Tent on Conc. Slab	4
307		Gasoline Storage	(Demolished)	
308 - C	50'x100'8½"	Warehouse, Food	Prefabricated Aluminum	4
309 - C	24'x24'8½"	Materials Testing Lab	Prefabricated Aluminum	4
310 - C	40'x100'	Elec. Overhaul & Stor	Butler Building - Aluminum	4
311	24'x24'8½"	Control Building	Prefabricated Aluminum	4
312 - C	1000 Bbl	Fresh Water Storage	Tank, Redwood - , Vertical	4
313 - C	50'x100'8½"	Supply Div Off & Whse	Prefabricated Aluminum	4
314 - C	24'x80'8½"	Plumbing & Refrigeration	Prefabricated Aluminum	4
314A - C	24'x74'8½"	Sheet Metal Shop		4
315 - C	24'x60'8½"	Electrical Repair Shop	Prefabricated Aluminum	4
316 - C	24'x60'8½"	Refrigeration Shop	Prefabricated Aluminum	4
317 - C	24'x60'8½"	Carpenter Shop	Prefabricated Aluminum	4
318 - C	24'x32'8½"	Typewriter Repair Shop	Prefabricated Aluminum	4
319 - C			Conc. Slab	6
320 - C	40'x100'	Warehouse	Jumbo Quonset	6
321 - C	20'4"x43'0½"	Assigned to Heavy Equip. Rigging Loft	Structural Steel	
322 - C	24'x60'8½"	DUKW, Meter Repair	Prefabricated Aluminum	6
322A - C	10'x15'	Steam Cleaning Pad	Concrete & Wood	6
322B - C	11'x13'	Storage Shed	Plywood Panel, Corrugated Roof	6
322C -	7'x10'	Storage Shed	Plywood Panel	6
322D -	7'x8'	Storage Shed	Plywood Panel	6
323 -C	24'x96'8½" 24'x12'	Radsafe Building	Prefabricated Aluminum	8
323A - C	14'2"x14'4"	Protective Clothing Stor	Tent on Wood Floor (4 Man)	8
324 - C	6'x6'x8'	Radsafe Mutment	Wooden Frame	8
325	24'x48'	Assigned to Marine Injector Shop	Prefabricated Aluminum	6
326		Fresh Water Storage	(Demolished)	
327	5'x9'	Flake Ice Machine	Conc. Slab	3
328	5'x9'	Flake Ice Machine	Conc. Slab	3
329	24'x60'8½" 10'8"x60'8½"	Laboratory	Prefabricated Aluminum	10
330	40'x80'6" 12'4"x19'8" 5'9"x8'8"	Laboratory	Steel & Aluminum	10
331	8'2"x8'2"	Shelter	Concrete, Underground	10
332	4'x4'	Guard Post at Personnel Door	Wood	8
333	15'x18'9"	AC Bldg., CMR	Wood and Aluminum	10
334	10'x10'	Shelter	Concrete Underground	10
335-336	6'x6'	Guard Tower	Wood, 8' above ground	10
337		Calibration Station	RAZED	
338	24'x56'	Assigned to Television Center	Prefabricated Aluminum	9
339 C	64'6"x100'6"	Power Plant	Steel and Aluminum	9
339A		Repair Shed	Wood & Corr. Metal	
339B		"Cat" Gen. Housing	Wood & Corr. Metal	
340A to D	4-20'x40'	Cylinder Shelters	Wood	10
340E to H	4-20'x40'	Cylinder Shelters	Wood	

BLDG. NO.	SIZE	USE	TYPE	
341	21'x41'	Shop & Storage	Steel and Aluminum	10
	25'x10'			
	13'x51'			
342	24'x60'8½"	Shop	Prefabricated Aluminum	10
342A - C	15'2"x25'8"	Dehumid. Section For Shop	Wood Frame - Plywood Siding	10
343 - C	9'x22'	K&6B, Parry Is. Aux. to Radio Sta.	Old Field Kitchen	9
344	75'x80'6"	Laboratory	Steel Frame, Wood & Aluminum	
	22'x77'		Siding and Roof	10
345A & B	2-56'6"x80'6"	Cylinder Racks	Concrete	10
346		Golf Course		5
347A - C	17'6"x28'x16'6"	Salt Water Intake	Reinf. Concrete, Underground	10
347B - C	14'x14'	Pump Shelter	Wood Frame, Corr. Alum. Roof	10
348	14'x18'		Conc. Slab	8
349	30' High	Elevated Water Storage	Wood Tower	
	5000 Bbl		Steel Tank	10
350	12'8"x25'0"	Storage Bldg. (CMR)	Plywood Panel, Composition Roof	10
351	16'x25'	2000# Magazine (CMR)	Steel Frame, Buried	10
351A	50'x50'		Concrete Slab	10
352	16'x32'	Quarters, 8 Man	Tent on Concrete Slab	8
353	16'x32'	Quarters, 8 Man	Tent - Wood Floor	8
354	16'x32'	Quarters, 8 Man	Tent - Wood Floor	8
355	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	8
356	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	8
357	70'x100'	Decontamination Area	Fenced	8
358	56'x90'	Tennis Court		8
359	16'x32'		Conc. Slab	8
360 C	41'x54'	DUKW Repair Shelter	Canvas on Wood w/Concrete Slab	6
361				
362	8'x12'	Guard Shelter (CMR)	Wood, Aluminum Roof	8
363	20'x50'	Conc.	Conc. Slab	8
364	14'2"x14'4"	Scientific, 2 Man	Tent - Wood Floor	9
365	16'x32'		Conc. Slab	10
366	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	10
367	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	10
368 - C	1000 Bbl	Diesel Fuel Oil	Tank, Steel, Bolted, Vertical (T-1)	9
369 - C	1000 Bbl	Diesel Fuel Oil	Tank, Steel, Bolted, Vertical (T-2)	10
370 - C	1000 Bbl	Diesel Fuel Oil	Tank, Steel, Bolted, Vertical (T-3)	10
371-375		Diesel Storage	(Demolished)	
376-379 - C	4-10,000 Gal.	Gasoline Storage	Tank, Steel, Horizontal (Abandoned)	2
380 - C	1-10,000 Bbl	Diesel Storage	Tank, Steel, Vert. Welded	2
381 - C	1-10,000 Bbl	Diesel Storage	Tank, Steel, Vert. Welded	2
382 - C	1-10,000 Bbl	Diesel Storage	Tank, Steel, Vert. Welded	2
383 - C	1- 5,000 Bbl	Mogas Storage	Tank, Steel, Vert. Welded	2
384 - C	1- 5,000 Bbl	Mogas Storage	Tank, Steel, Vert. Welded	2
385				
386				
387				
388				
389				
390				
391				
392				

BLDG. NO.	SIZE	USE	TYPE	
3(				
394	5'x5'	Water Pump Pad	Concrete	11
395	8'x30'	Rock Crusher	Str. Steel on Conc. Fdn	11
396	12'x16'	Power Shed	Wood, Corr. Metal Roof	11
397	15'x20'	Batch Hopper	Str. Steel on conc. piers	11
398	10'x10'	Water Tower	Navy Cube on Timber Tower	11
399 - C	20'x20'	Iron Workers Shop	Wooden Frame	4
400		Electrical Warehouse	Demolished	
401 - C	40'x100'	Paint Shop & Parts Warehouse	Jumbo Quonset	4
402		Tool Crib & Parts Whse	Demolished	
403		Heavy Equip. Parts Whse	Demolished	
404 - C	40'x100'	Heavy Equipment Repr. Shop	Jumbo Quonset	4
404A - C	30'x30'	Welding Shop	Wood, Corr. Alum. Roof	4
405 - C	40'x100'	Heavy Equip. Machine Shop	Jumbo Quonset	4
406 - C	24'x60'	Marine Operations	Prefabricated Aluminum	4
	4'x4'12'	Tower	Wood on Conc. Piers	4
407	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	11
408 - C	4'x4'	Guard Shack	Wood	
409 - C	24'x44'8½"	Refreshment Bldg.	Prefabricated Aluminum	4
410 - C	24'x32'8½"	Salt Water Pump Sta.	Prefabricated Aluminum	4
411	44'x83'x34'9"	Assembly Building	Steel and Aluminum	11
412	25'6"x31'x18'6"	High Explosives Bldg	Steel and Aluminum	11
413	22'x22'x14'4"	Magazine	Concrete, Earth Covered	11
414	8'0"x12'0"	Guardhouse, Ass'y Area	Wood	11
41	21'4"x25'4"x12'6"	Magazine	Concrete, Earth Covered	11
41[illegible]	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	11
417	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	11
418	25'0"x29'0"x9'9½"	Shop & Laboratory	Plywood, Conc. Floor, Corr. Roof	5
418A	20'0"x40'0"x13'9"		Wood Shelter	6
419	81'8"x136'8"	Barge Slip, "U" Shape Ass'y Area	Steel & Wooden Piling	11
420 - C	50'x60'	Marine Rigging Loft	[illegible] -Steel, Wood & Aluminum	6
421 - C	3200 Sq. Ft. 60'x40'	Heavy Equip. Repair	Concrete Slab	
422 - C	24'x40'	Oxygen Tabernacle	Wood w/Concrete Slab	1
423 - M	24'x40'	JTF Recreation	Prefabricated Aluminum	5
424 - C	40'x100'	Paint Shop	Butler Type - Aluminum	6
425 - C	40'x60'	Paint Storage	Butler Type - Aluminum	6
426 - C	80'x100'	Machine Shop	Butler Type - Aluminum	6
42 7 - C	50'x80'	Assigned to Carpenter Shop	Butler Type - Aluminum	6
42 8	24'x80'	Assigned to Saw Mill	Prefabricated Aluminum	6
429	12'x24'	Marine Welding Shop	Prefabricated Aluminum	6
430	50'x300'	Assigned to Vehicle, Tire & Welding Shop	Butler Type - Aluminum	6
431	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
432	14'2"x14'4"	Scientific, 4 Man	Tent on Conc. Slab	5
433 - C	46' High	Flag Pole	Steel Pipe	5
434 - C	22' High	Flag Pole	Steel Pipe	5
435				

BLDG. NO.	SIZE	USE	TYPE
436			
437			
438			
439			
440			
441			
442			
443			
444			
445			
446			
447			
448			
449			
450			
451			
452			
453			
454			
455			
456			
457			
'58			
,9			
460			
461			
462			
463			
464			
465			
466			
467			
468			
469			
470			
471			
472			
473			
474			
475			
476			
477			
478			
479			
480			
481			
482			
'93			
,4			
485			
486			
487			

~~OFFICIAL USE ONLY~~

BLDG. NO.	SIZE	USE	TYPE	
48[illegible]				
48				
490				
491				
492				
493				
494				
495				
496				
497				
498				
499				
500				
501 - C	40'x180'	Warehouse, Electrical	Prefabricated Aluminum	4
502 - C	40'x180'	Warehouse, Plumbing	Prefabricated Aluminum	4
503 - C	40'x101'	Warehouse, Shipping	Prefabricated Aluminum	4
504 - C	40'x100'	Whse. Dry Stores	Prefabricated Aluminum	4
505-6 - C	80'x180'	Whse., Heavy Duty Parts	Prefabricated Aluminum	4
507-8 - C	80'x140'	Whse., Camp Supplies	Prefabricated Aluminum	4
509-10 - C	80'x100'	Whse., General Stores	Prefabricated Aluminum	4
511 - 512 - C	80'x100'	Warehouse, A.E.C.	Prefabricated Aluminum	4
512 - C				4
513	24'2"x60'1½"	New Distillation Plant	Prefabricated Steel	4
514	24'x40'	Assigned to Distillation Maintenance Shop	Prefabricated Steel	4
515 - C	50'2"x80'	Receiving & Classification Whse	Prefabricated Steel	4
51	40'x140'	Assigned to Bulk Storage Whse	Butler Bldg.	2
517				4
518				
519				
520				
521				
522				
523				
524				
525				
526				
527				
528				
529				
530				
531				
532				
533				
534				
535				

BLDG. NO.	SIZE	USE	TYPE	
536				
537				
538				
539				
540				
541				
542				
543				
544				
545				
546				
547				
548				
549				
550				
551 - C	10'x12'	Latrine, Warehouse Area	Aluminum	4
552 - C	10'x12'	Latrine, Warehouse Area	Aluminum	4
553				
554				
556				
557				
558				
559				
0				
561				
562				
563				
564				
565				
566				
567				
568				
569				
570				
571				
572				
573				
574				
575				
576				
577				
578				
579				
580				
581				
582				
83				

BLDG. NO.	SIZE	USE	TYPE	
606-627	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	3
628-645	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	4
646				
647-651	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	4
652 - 671	16'x32'	Quarters, 8 Man	Tent on Conc. Slab	3
680 C	24'x20'8½"	Latrine, 100 Man	Prefabricated Aluminum	3
681 C	24'x20'8½"	Latrine, 100 Man	Prefabricated Aluminum	3
682 C	24'x20'8½"	Latrine, 100 Man	Prefabricated Aluminum	3
683 C	24'x20'8½"	Latrine, 100 Man	Prefabricated Aluminum	3
684 C	24'x20'8½"	Latrine, 100 Man	Prefabricated Aluminum	3

10	2.30	2.52	2.75	2.98	3.21	3.44	3.67	3.90	4.13	4.36
20	4.59	4.82	5.05	5.28	5.51	5.74	5.97	6.20	6.43	6.67
30	6.90	7.13	7.36	7.59	7.82	8.05	8.28	8.51	8.74	8.97
40	9.20	9.43	9.66	9.89	10.12	10.35	10.58	10.81	11.04	11.27
50	11.48	11.71	11.94	12.17	12.40	12.63	12.86	13.09	13.32	13.55
60	13.77	14.00	14.23	14.46	14.69	14.92	15.15	15.37	15.61	15.84
70	16.07	16.30	16.53	16.76	16.99	17.22	17.45	17.68	17.91	18.14
80	18.37	18.60	18.83	19.06	19.29	19.52	19.75	19.98	20.21	20.44
90	20.66	20.89	21.12	21.35	21.58	21.81	22.04	22.27	22.50	22.73
100	22.96	23.19	23.42	23.65	23.88	24.11	24.33	24.56	24.79	25.02
110	25.25	25.48	25.71	25.94	26.17	26.40	26.63	26.86	27.09	27.32
120	27.55	27.78	28.01	28.24	28.47	28.70	28.93	29.16	29.39	29.61
130	29.84	30.07	30.30	30.53	30.76	30.99	31.22	31.45	31.68	31.91
140	32.14	32.37	32.60	32.83	33.06	33.29	33.52	33.75	33.98	34.21
150	34.44	34.67	34.90	35.13	35.36	35.59	35.81	36.04	36.27	36.50
160	36.73	36.96	37.19	37.42	37.65	37.88	38.11	38.34	38.57	38.80
170	39.03	39.26	39.49	39.72	39.95	40.18	40.40	40.63	40.86	41.09
180	41.32	41.55	41.78	42.01	42.24	42.47	42.70	42.93	43.16	43.39
190	43.62	43.85	44.08	44.31	44.54	44.77	45.00	45.23	45.46	45.69
200	45.91	46.14	46.37	46.60	46.83	47.06	47.29	47.52	47.75	47.98
210	48.21	48.44	48.67	48.90	49.13	49.36	49.59	49.82	50.05	50.28
220	50.51	50.73	50.96	51.19	51.42	51.65	51.88	52.11	52.34	52.57
230	52.80	53.03	53.26	53.49	53.72	53.95	54.18	54.41	54.64	54.87
240	55.10	55.33	55.56	55.79	56.02	56.25	56.47	56.70	56.93	57.16
250	57.39	57.62	57.85	58.08	58.31	58.54	58.77	59.00	59.23	59.46
260	59.69	59.92	60.15	60.38	60.61	60.84	61.07	61.29	61.52	61.75
270	61.98	62.21	62.44	62.67	62.90	63.13	63.36	63.59	63.82	64.05
280	64.28	64.51	64.74	64.97	65.20	65.43	65.66	65.89	66.12	66.35
290	66.57	66.80	67.03	67.26	67.49	67.72	67.95	68.18	68.41	68.64
300	68.87	69.10	69.33	69.56	69.79	70.02	70.25	70.48	70.71	70.94
310	71.17	71.40	71.63	71.86	72.09	72.32	72.54	72.77	73.00	73.23
320	73.46	73.69	73.92	74.15	74.38	74.61	74.84	75.07	75.30	75.53
330	75.76	75.99	76.22	76.45	76.68	76.91	77.13	77.36	77.59	77.82
340	78.05	78.28	78.51	78.74	78.97	79.20	79.43	79.66	79.89	80.12
350	80.35	80.58	80.81	81.04	81.27	81.50	81.73	81.96	82.19	82.42
360	82.64	82.87	83.10	83.33	83.56	83.79	84.02	84.25	84.48	84.71
370	84.94	85.17	85.40	85.63	85.86	86.09	86.32	86.55	86.78	87.01
380	87.24	87.47	87.70	87.93	88.16	88.39	88.62	88.85	89.08	89.31
390	89.53	89.76	89.99	90.22	90.45	90.68	90.91	91.14	91.37	91.60
400	91.83	92.06	92.29	92.52	92.75	92.98	93.20	93.43	93.66	93.89
410	94.12	94.35	94.58	94.81	95.04	95.27	95.50	95.73	95.96	96.19
420	96.42	96.65	96.88	97.11	97.34	97.57	97.80	98.03	98.26	98.49
430	98.71	98.94	99.17	99.40	99.63	99.86	100.09	100.32	100.55	100.78
440	101.01	101.24	101.47	101.70	101.93	102.16	102.39	102.62	102.85	103.08
450	103.30	103.53	103.76	103.99	104.22	104.45	104.68	104.91	105.14	105.37
460	105.60	105.83	106.06	106.29	106.52	106.75	106.98	107.21	107.44	107.67
470	107.90	108.13	108.36	108.59	108.82	109.05	109.28	109.51	109.74	109.97
480	110.19	110.42	110.65	110.88	111.11	111.34	111.57	111.80	112.03	112.26
490	112.49	112.72	112.95	113.18	113.41	113.64	113.87	114.10	114.33	114.56
500	114.78	115.01	115.24	115.47	115.70	115.93	116.16	116.39	116.62	116.85

$\frac{x^{006}}{43\,560}$ = 0.22956841 × sq. in. inches

VOLUME IN CUBIC YARDS FOR GIVEN NUMBER OF ACRES AND GRADE OF 0.1 FOOT

Acres	0	1	2	3	4	5	6	7	8	9
		16.14	32.27	48.40	64.54	80.67	96.80	112.9	129.1	145.2
1	161.3	177.4	193.6	209.7	225.8	242.0	258.1	274.3	290.4	306.5
2	322.7	338.8	354.9	371.1	387.2	403.3	419.5	435.6	451.7	467.9
3	484.0	500.1	516.3	532.4	548.5	564.7	580.8	596.9	613.1	629.2
4	645.3	661.5	677.6	693.7	709.9	726.0	742.1	758.3	774.4	790.5
5	806.7	822.8	838.9	855.1	871.2	887.3	903.5	919.6	935.7	951.9
6	968.0	984.1	1000	1016	1032	1048	1065	1081	1097	1113
7	1129	1145	1161	1178	1194	1210	1226	1242	1258	1275
8	1291	1307	1323	1339	1355	1371	1387	1403	1420	1436
9	1452	1468	1484	1500	1516	1533	1549	1565	1581	1597
10	1613	1629	1645	1662	1678	1694	1710	1726	1742	1759
11	1775	1791	1807	1823	1839	1855	1871	1887	1904	1920
12	1936	1952	1968	1984	2000	2016	2033	2049	2065	2081
13	2097	2113	2129	2145	2162	2178	2194	2210	2226	2243
14	2259	2275	2291	2307	2323	2339	2355	2372	2388	2404
15	2420	2436	2452	2468	2484	2501	2517	2533	2549	2565
16	2581	2597	2614	2630	2646	2662	2678	2694	2710	2727
17	2743	2759	2775	2791	2807	2823	2839	2856	2872	2888
18	2904	2920	2936	2952	2968	2985	3001	3017	3033	3049
19	3065	3081	3097	3113	3130	3146	3162	3178	3194	3211
20	3227	3243	3259	3275	3291	3307	3323	3340	3356	3372
21	3388	3404	3420	3436	3452	3469	3485	3501	3517	3533
22	3549	3565	3581	3597	3614	3630	3646	3662	3678	3695
23	3711	3727	3743	3759	3775	3791	3807	3824	3840	3856
24	3872	3888	3904	3920	3936	3953	3969	3985	4001	4017
25	4033	4049	4065	4082	4098	4114	4130	4146	4162	4178
26	4195	4211	4227	4243	4259	4275	4291	4308	4324	4340
27	4356	4372	4388	4404	4420	4436	4453	4469	4485	4501
28	4517	4533	4550	4566	4582	4598	4614	4630	4646	4663
29	4679	4695	4711	4727	4743	4759	4775	4792	4808	4824
30	4840	4856	4872	4888	4904	4920	4937	4953	4969	4985
31	5001	5017	5033	5049	5066	5082	5098	5114	5130	5146
32	5163	5179	5195	5211	5227	5243	5259	5276	5292	5308
33	5324	5340	5356	5372	5388	5405	5421	5437	5453	5469
34	5485	5501	5518	5534	5550	5566	5582	5598	5614	5631
35	5647	5663	5679	5695	5711	5727	5743	5760	5776	5792
36	5808	5824	5840	5856	5872	5889	5905	5921	5937	5953
37	5969	5985	6002	6018	6034	6050	6066	6082	6098	6114
38	6131	6147	6163	6179	6195	6211	6227	6243	6259	6276
39	6292	6308	6324	6340	6356	6372	6388	6405	6421	6437
40	6453	6469	6485	6502	6518	6534	6550	6566	6582	6598
41	6615	6631	6647	6663	6679	6695	6711	6728	6744	6760
42	6776	6792	6808	6824	6840	6857	6873	6889	6905	6921
43	6937	6953	6970	6986	7002	7018	7034	7050	7066	7083
44	7099	7115	7131	7147	7163	7179	7195	7212	7228	7244
45	7260	7276	7292	7308	7324	7341	7357	7373	7389	7405
46	7421	7437	7453	7470	7486	7502	7518	7534	7550	7566
47	7583	7599	7615	7631	7647	7663	7679	7695	7712	7728
48	7744	7760	7776	7792	7808	7824	7841	7857	7873	7889
49	7905	7921	7937	7953	7970	7986	8002	8018	8034	8050
50	8066	8083	8099	8115	8131	8147	8163	8179	8196	8212

[illegible]

[illegible] AND [illegible]

[illegible] OCTOBER 1953

[illegible] = [illegible]
[illegible] = Deviation [illegible] from a straight [illegible] to the earth.
[illegible] = [illegible] point of [illegible]

DISTANCE		CORRECTION	DISTANCE		CORRECTION
[illegible]	- [illegible]	[illegible]	[illegible]	- [illegible]349.[illegible]	.043
14[illegible]	- [illegible]	[illegible]	[illegible]	- [illegible]364.42	.044
[illegible]	- [illegible]	[illegible]	[illegible]	- [illegible]	.045
3[illegible].4[illegible]	- [illegible]	[illegible]	[illegible]	- [illegible]	.046
[illegible]2.6[illegible]	- 43[illegible]	[illegible]	[illegible]	- [illegible]	.047
4[illegible]	- 47[illegible]	[illegible]	14[illegible].04	- 1424.44	.048
479.0[illegible]	- [illegible]1.4[illegible]	[illegible]	[illegible]4.44	- [illegible]39.06	.049
[illegible]1.47	- [illegible]	[illegible]	[illegible]	- [illegible]	.050
560.1[illegible]	- [illegible]	[illegible]	[illegible]	- [illegible]	.051
596.35	- 630.44	[illegible]	[illegible]	- [illegible]	.052
630.44	- 662.7[illegible]	[illegible]	[illegible]	- [illegible]96.05	.053
[illegible]62.7[illegible]	- [illegible]	[illegible]	[illegible]	- 1509.95	.054
693.63	- [illegible]	[illegible]	1509.[illegible]	- 1523.73	.055
[illegible]3.12	- [illegible]	[illegible]	[illegible]	- [illegible]37.44	.056
[illegible]1.52	- [illegible]	[illegible]	[illegible]	- [illegible]50.96	.057
[illegible].88	- 80[illegible]	[illegible]	[illegible]	- [illegible]64.42	[illegible]
[illegible]05.27	- 830.[illegible]	[illegible]	1564.4[illegible]	- 1[illegible]77.74	[illegible]
830.[illegible]	- [illegible]	[illegible]	[illegible].74	- 15[illegible].93	.060
[illegible]5.66	- [illegible]	[illegible]	1590.93	- [illegible]3.99	.061
[illegible].71	- [illegible]3.1[illegible]	[illegible]	16[illegible]3.9[illegible]	- 1[illegible]17.[illegible]	.062
[illegible]3.19	- [illegible]	[illegible]	[illegible]	- 1[illegible].87	.063
[illegible]	- [illegible]4[illegible]	[illegible]	[illegible]	- [illegible]42.68	.064
[illegible].40	- [illegible]	[illegible]	[illegible]	- [illegible].29	.065
[illegible]	- [illegible]1.54	[illegible]	[illegible]	- [illegible]7.90	.066
[illegible]1.54	-1032.3[illegible]	[illegible]4	[illegible]	- 1[illegible].3[illegible]	[illegible]
1032.37	-10[illegible]	[illegible]	[illegible]	- [illegible]92.[illegible]	[illegible]
[illegible]	-[illegible]	[illegible]	[illegible]	- [illegible]5.16	.069
[illegible]	-[illegible]	[illegible]	[illegible]	- [illegible]17.38	.070
[illegible]	-[illegible]	[illegible]	[illegible]	- [illegible].48	.071
[illegible]	-[illegible]	[illegible]	[illegible]	- [illegible]	[illegible]
[illegible]	-[illegible]	[illegible]	[illegible]	- [illegible].54	.073
[illegible]	-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

DISTANCE			CORRECTION
[illegible]	-	1912.30	[illegible]
1912.30	-	1913.23	[illegible]
1913.23	-	1924.17	.089
1924.17	-	1935.03	.090
1935.03	-	1945.77	.090
1945.77	-	1956.51	.091
1956.51	-	1967.18	.092
1967.18	-	1977.79	.093
1977.79	-	1988.33	.094
1988.33	-	1998.81	.095
1998.81	-	2009.22	.096
2009.22	-	2019.63	.097
2019.63	-	2029.98	.098
2029.98	-	2040.27	.099
2040.27	-	2050.49	.100
2050.49	-	2060.64	.101
2060.64	-	2071.44	.102
2071.44	-	2080.88	.103
2080.88	-	2090.91	.104
2090.91	-	2100.87	.105
2100.87	-	2114.00	.106
2114.00	-	2120.66	.107
2120.66	-	2130.49	.108
2130.49	-	2140.33	.109
2140.33	-	2150.09	.110
2150.09	-	2159.79	.111
2159.79	-	2169.43	.112
2169.43	-	2179.07	.113
2179.07	-	2188.64	.114
2188.64	-	2198.21	.115
2198.21	-	2207.66	.116
2207.66	-	2217.10	.117
2217.10	-	2226.54	.118
2226.54	-	2235.92	.119
2235.92	-	2245.24	.120
2245.24	-	2254.55	.121
2254.55	-	2263.80	.122
2263.80	-	2273.05	.123
2273.05	-	2282.23	.124
2282.23	-	2291.35	.125
2291.35	-	2300.67	.126
2300.67	-	2309.53	.127
2309.53	-	2318.53	.128
2318.53	-	2327.57	.129
2327.57	-	2336.57	.130
2336.57	-	2345.49	.131
2345.49	-	2354.36	.132
2354.36	-	2363.29	.133
2363.29	-	2372.20	.134
2372.20	-	2381.09	.135
2381.09	-	2389.97	.136
2389.97	-	2398.84	.137
2398.84	-	2407.73	.138

DISTANCE			CORRECTION
[illegible]	-	2415.73	.139
[illegible]	-	2424.40	.140
2424.40	-	2433.00	.141
2433.00	-	2441.60	.142
2441.60	-	2450.14	.143
[illegible]	-	2458.68	.144
[illegible]	-	2467.22	.145
2467.22	-	2475.63	.146
2475.63	-	2484.10	.147
2484.10	-	2492.51	.148
2492.51	-	2500.85	.149
2500.85	-	2509.19	.150
2509.19	-	2517.54	.151
2517.54	-	2525.81	.152
2525.81	-	2534.10	.153
2534.10	-	2542.24	.154
2542.24	-	2550.59	.155
2550.59	-	2558.74	.156
2558.74	-	2566.96	.157
2566.96	-	2575.04	.158
2575.04	-	2583.90	.159
2583.90	-	2591.21	.160
2591.21	-	2599.29	.161
2599.29	-	2607.32	.162
2607.32	-	2615.34	.163
2615.34	-	2623.36	.164
2623.36	-	2631.47	.165
2631.47	-	2639.20	.166
2639.20	-	2647.16	.167
2647.16	-	2654.98	.168
2654.98	-	2662.88	.169
2662.88	-	2670.70	.170
2670.70	-	2678.53	.171
2678.53	-	2686.54	.172
2686.54	-	2694.12	.173
2694.12	-	2701.88	.174
2701.88	-	2709.64	.175
2709.64	-	2717.34	.176
2717.34	-	2724.97	.177
2724.97	-	2732.78	.178
2732.78	-	2741.31	.179
2741.31	-	2747.49	.180
2747.49	-	2755.50	.181
2755.50	-	2763.15	.182
2763.15	-	2770.70	.183
2770.70	-	2778.20	.184
2778.20	-	2785.77	.185
2785.77	-	2793.08	.186
2793.08	-	2800.71	.187
2800.71	-	2808.21	.188
2808.21	-	2815.64	.189
2815.64	-	2823.00	.190
2823.00	-	2830.40	.191

DISTANCE			CORRECTION
[illegible]	-	2857.84	[illegible]
[illegible]	-	2865.21	[illegible]
[illegible]	-	2872.58	[illegible]
[illegible]	-	2879.95	.232
[illegible]	-	2887.32	.196
[illegible]	-	2894.44	[illegible]
2894.44	-	2901.76	.198
2901.76	-	2908.96	.199
2908.96	-	2916.37	.200
2916.37	-	2923.42	.201
2923.42	-	2930.68	.202
2930.68	-	2937.76	.203
2937.76	-	2944.96	.204
2944.96	-	2952.07	.205
2952.07	-	2959.19	.206
2959.19	-	2966.30	.207
2966.30	-	2973.42	.208
2973.42	-	2980.47	.209
2980.47	-	2987.52	.210
2987.52	-	2994.63	.211
2994.63	-	3001.55	.212
3001.55	-	3008.60	.213
3008.60	-	3015.59	.214
3015.59	-	3022.75	.215
3022.75	-	3029.50	.216
3029.50	-	3036.48	.217
3036.48	-	3043.40	.218
3043.40	-	3050.32	.219
3050.32	-	3057.24	.220
3057.24	-	3064.10	.221
3064.10	-	3070.56	.222
3070.56	-	3077.81	.223
3077.81	-	3084.60	.224
3084.60	-	3091.46	.225
3091.46	-	3098.25	.226
3098.25	-	3105.04	.227
3105.04	-	3111.83	.228
3111.83	-	3118.50	.229
3118.50	-	3125.29	.230
3125.29	-	3132.01	.231
3132.01	-	3138.82	.232
3138.82	-	3145.47	.233
3145.47	-	3152.19	.234
3152.19	-	3158.79	.235
3158.79	-	3165.43	.236
3165.43	-	3172.12	.237
3172.12	-	3178.71	.238
3178.71	-	3185.37	.239
3185.37	-	3191.97	.240
3191.97	-	3198.50	.241
3198.50	-	3205.08	.242

DISTANCE			CORRECTION
[illegible]	-	3191.63	.243
[illegible]	-	3198.23	.244
[illegible]	-	3204.89	.245
[illegible]	-	3211.23	.246
[illegible].23	-	3217.77	.247
[illegible]	-	3224.30	.248
[illegible]	-	3230.77	.249
[illegible]	-	3237.23	.250
[illegible].2	-	3243.70	.251
[illegible]	-	3250.17	.252
[illegible]	-	3256.51	.253
6[illegible]	-	3263.98	.254
[illegible]	-	3269.38	.255
[illegible]	-	3275.92	.256
[illegible]	-	3282.12	.257
[illegible]	-	3288.53	.258
[illegible]	-	3294.86	.259
[illegible]	-	3301.20	.260
[illegible]	-	3307.54	.261
[illegible]	-	3313.88	.262
[illegible]	-	3320.22	.263
[illegible].22	-	3326.49	.264
[illegible]	-	3332.77	.265
[illegible]	-	3339.62	.266
[illegible]	-	3345.31	.267
[illegible]	-	351.52	.268
351.52	-	3357.73	.269
3357.73	-	3364.01	.270
3364.01	-	3370.22	.271
[illegible].22	-	3376.43	.272
3376.43	-	3382.57	.273
[illegible]	-	3388.78	.274
3388.78	-	3394.99	.275
[illegible].99	-	3401.68	.276
[illegible]	-	3407.28	.277
[illegible]	-	3413.36	.278
[illegible]	-	3419.50	.279
[illegible]	-	3425.58	.280
[illegible]	-	3431.66	.281
[illegible]	-	3437.74	.282
[illegible].94	-	3443.89	.283
[illegible]	-	3449.67	.284
[illegible]	-	3455.98	.285
[illegible].08	-	3462.71	.286
[illegible].71	-	3468.08	.287
[illegible].08	-	3473.96	.288
[illegible]	-	3480.10	.289
[illegible]	-	3486.12	.290
[illegible]	-	3492.14	.291
[illegible]	-	[illegible]	.292
[illegible]	-	3504.10	.293

DISTANCE			CORRECTION
3504.10	-	3510.05	.294
3510.05	-	3516.00	.295
3516.00	-	3522.47	.296
3522.47	-	3527.91	.297
3527.91	-	3533.86	.298
3533.86	-	3539.68	.299
3539.68	-	3545.63	.300
3545.63	-	3550.93	.301
3550.93	-	3557.40	.302
3557.40	-	3563.22	.303
3563.22	-	3569.17	.304
3569.17	-	3574.99	.305
3574.99	-	3580.88	.306
3580.88	-	3586.70	.307
3586.70	-	3592.21	.308
3592.21	-	3598.34	.309
3598.34	-	3604.16	.310
3604.16	-	3609.92	.311
3609.92	-	3615.74	.312
3615.74	-	3622.08	.313
3622.08	-	3627.25	.314
3627.25	-	3633.01	.315
3633.01	-	3638.77	.316
3638.77	-	3644.52	.317
3644.52	-	3650.28	.318
3650.28	-	3655.97	.319
3655.97	-	3661.73	.320
3661.73	-	3667.42	.321
3667.42	-	3673.11	.322
3673.11	-	3678.80	.323
3678.80	-	3684.50	.324
3684.50	-	3690.18	.325
3690.18	-	3695.82	.326
3695.82	-	3701.51	.327
3701.51	-	3707.13	.328
3707.13	-	3712.76	.329
3712.76	-	3718.39	.330
3718.39	-	3724.02	.331
3724.02	-	3729.64	.332
3729.64	-	3735.31	.333
3735.31	-	3740.32	.334
3740.32	-	3746.39	.335
3746.39	-	3752.02	.336
3752.02	-	3757.58	.337
3757.58	-	3763.15	.338
3763.15	-	3769.64	.339
3769.64	-	3774.31	.340
3774.31	-	3779.99	.341
3779.99	-	3785.33	.342
3785.33	-	3791.13	.343
3791.13	-	3796.33	.344
3796.33	-	3802.10	.345

DISTANCE			CORRECTION
3802.10	-	3807.39	.346
3807.39	-	3812.56	.347
3812.56	-	3818.32	.348
3818.32	-	3823.82	.349
3823.82	-	3829.25	.350
3829.25	-	3834.75	.351

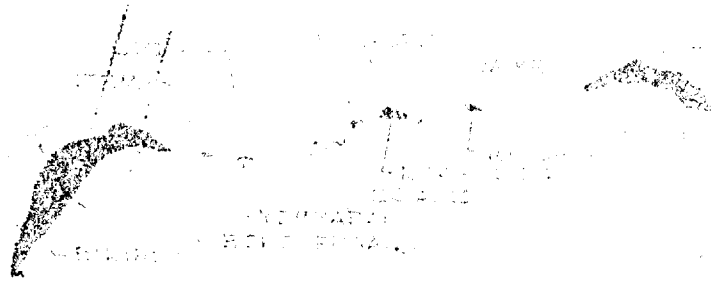
At Lat	1' Long in Lat = Ft	1' of Long = Feet
11° 21'	[illegible]	.48002
22'	[illegible]	.47424
23'	80394	.46846
24'	80414'	.46268
25'	80434'	.45690
26'	80454	.45112
27'	80474	.44534
28'	80494	.43945
29'	80514'	.43356
30'	80534	.42767
31'	80554	.42179
32'	80574	.41590
33'	80593	.41001
34'	80613	.40412
35'	80633	.39823
36'	80653	.39234
37'	80673	.38646
38'	80693	.38057
39'	[illegible]	.37468
40'	[illegible]	.36879

CORRECTIONS FOR FEET AND TENTHS OF A MILE

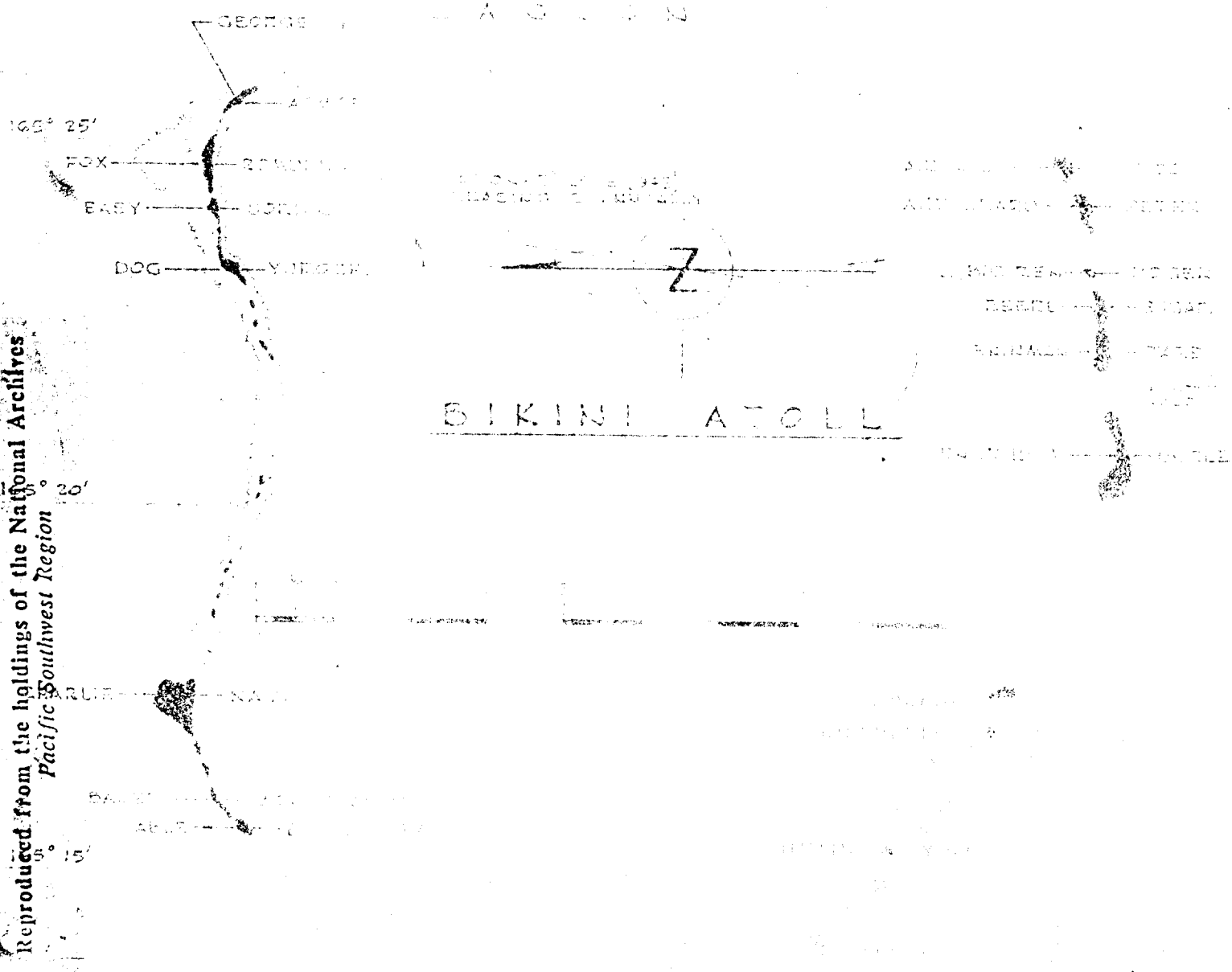
Height (in ft.) ÷ 5280 (in feet) = Height (in ft.) x 1.32

MILES	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0								0.4	0.5
1								1.9	2.1
2								4.3	4.8
3								8.3	8.7
4								13.2	13.8
5	14.4							19.3	20.0
6								26.6	27.3
7								34.9	35.8
8								44.5	45.5
9								55.1	56.3
10								66.9	68.2
11								79.9	81.3
12									95.5
13									110.9
14									127.4
15									145.1
16									163.9
17									183.9
18									205.0
19									227.2
20									250.7
21									275.2
22									300.9
23									327.8
24									355.8
25									384.9
26									416.2
27									446.7
28									479.3
29									513.0
30									547.9
31									583.9
32									621.1
33									659.5
34									698.9
35									739.6
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9

(0.5738333)



PACIFIC
OCEAN



BIKI ATOLL

BENCH MARKS

SITE	STATION	ELEV.	FIELD BOOK	PAGE	DATE	DESCRIPTION	REMARKS
ABLE	Tria Sta Able	7.58	1026	18	10/24/53	H & N Disc in 3' Conc Cube	Continuation of Charlie Datum
	P.O.L. #2	7.02	1026	18	10/24/53	H & N Disc in 3' Conc Cube	Continuation of Charlie Datum
BAKER	None						
CHARLIE	Tria Sta Charlie	6.420	1036	13-15	11/ 5/53	H & N Disc in 3' Conc Cube	This Datum is known to be high by approximately 1.5 Feet.
	R.M. #1	3.440	1036	13-15	11/ 5/53	H & N Disc in 3' Conc Cube	Do
	R.M. #2	3.380	1036	13-15	11/ 5/53	H & N Disc in 3' Conc Cube	Do
	R.M. #3	.590	1036	13-15	11/ 5/53	H & N Disc in 3' Conc Cube	Do
[illegible]	[illegible]	[illegible]	1028	30	11/20/53	H & N Disc in 3' Conc Cube	Tide Observations
[illegible]	None						
[illegible]	Tria Sta [illegible]	3.332	1028	5	9/ 2/53	H & N Disc in 3' Conc Cube	
	R.M. #1	9.015	1028	5	9/ 2/53	H & N Disc in 1'x2½'x2½' Prismoid	
	R.M. #2	4.705	1028	5	9/ 2/53	Do	
	R.M. #3	7.805	1028	5	9/ 2/53	Do	
	[illegible]	4.11	1028	[illegible]	9/ 4/53	H & N Disc in 3' Conc Cube	
[illegible]	[illegible]	4.775	1055	14	9/ 6/54	Disc in Concrete	
[illegible]	Tria Sta No How	13.38	1039	29	12/ 7/53	H & N Disc in 3' Conc Cube	
	R.M. #1	12.70	1039	29	12/ 7/53	3"x3" Brass Plate in 15 Gal Drum	Filled with Concrete
	R.M. #2	14.29	1039	29	12/ 7/53	Do	
	R.M. #3	14.36	1039	29	12/ 7/53	Do	
	Tria Sta So How	8.98	1040	25	12/ 7/53	H & N Disc in 3' Conc Cube	
	R.M. #1	8.44	1040	25	12/ 7/53	3"x3" Brass Plate in 15 Gal Drum	Filled with Concrete
	R.M. #2	5.97	1040	25	12/ 7/53	Do	
	R.M. #3	8.47	1040	25	12/ 7/53	Do	
	Tria Sta Kans	10.77	1040	25	12/ 7/53	USN Disc in 10½" Square of Conc	400' NW of No How
	Tria Sta Line	9.94	1040	25	12/ 7/53	Center Punched Mach Bolt in Conc	
ITEM	None						
JIG	Tria Sta Jig	8.34	1039	12	11/ 5/53	H & N Disc in 3' Conc Cube	
KING	None						

BENCH MARKS

			FIELD BOOK	PAGE	DATE	DESCRIPTION	REMARKS
LOVE	Tria Sta Love	11.73	1039	11	11/ 5/53	H & N Disc in 3' Conc Cube	
MIKE	Tria Sta Ebi	9.940	1039	10	11/ 5/53	3/4" Mach Bolt in Hex Conc Block	
	Tria Sta Mike	10.00	1039	11	11/ 5/53	H & N Disc in 3' Conc Cube	
NAN	Tria Sta Enyu (H&N Nan)	[illegible]	1010	23	6/17/53	H & N Disc Grouted into 9" Square Conc Pillar	
	Mon Nile	[illegible]	1010	23	6/17/53	H & N Disc in 3' Conc Cube	
	Mon Neon	[illegible]	1039	15	11/10/53	H & N Disc in 3' Conc Cube	
	Mon Nuget	[illegible]	1039	16	11/10/53	H & N Disc in 3' Conc Cube	
	[illegible]	[illegible]	Unknown			H & N Disc in 15" Square Conc Block	
	[illegible]	[illegible]	Unknown			Bronze Plug in Collar Set in 15" Square Conc Block	
ETA	Tria Sta Eta	[illegible]	1038	5	9/26/53	H & N Disc in 3' Conc Cube	
	R.M. #1	[illegible]	1038	5	9/26/53	H & N Disc in Conc Filled 50 Gal Barrel	
	R.M. #2	[illegible]	1038	5	9/26/53	H & N Disc on Conc Filled 15 Gal Barrel	
	Tria Sta [illegible]	[illegible]	1029	20	8/26/53	H & N Disc in 30" Dia Conc Block	
	Mon Enyx	[illegible]	[illegible]	14	8/22/53	H & N Disc in Conc Mon	
[illegible]	Mon [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	H & N Disc in Conc Mon	
	Mon [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	H & N Disc in [illegible] Conc [illegible]	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	Mon [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	H & N Disc in Conc Mon	
	Mon Zojex	[illegible]	1029	13	8/22/53	H & N Disc in Conc Mon	
ETAN	Mon Enith	[illegible]	1029	3	7/21/53	H & N Disc in Conc Mon	
	Tria Sta Salt	9.600	1036	6	10/21/53	H & N Disc in 3' Conc Cube	
	R.M. #1	7.757	1036	6	10/21/53	H & N Disc in Half Barrel of Conc	
	R.M. #2	7.135	1036	6	10/21/53	Do	
	R.M. #3	7.709	1036	6	10/21/53	Do	
	Station 2220 Bench Marks						
	B.M. #2	8.528	1046	15	10/29/53	All Baseline Bench Marks consist of 2" Dia Pipe driven to refusal with a 3"x3"x3/8" Piece of Iron with a $\frac{1}{2}$" Dia by $\frac{1}{4}$" High Brass knob on it, welded to the pipe.	
	B.M. #3	9.352	1046	15	10/29/53		
	B.M. #4	9.785	1046	15	10/29/53		
	B.M. #5	10.299	1046	15	10/29/53		
	B.M. #6	10.560	1046	15	10/29/53		
	B.M. #7	10.958	1046	15	10/29/53		

BIKIN ATOLL

BENCH MARKS

PARE	Station 2220 Bench Marks					
	B.M. #8	11.376	1046	15	10/29/53	All Baseline Bench Marks consist
	B.M. #9	11.772	1046	15	10/29/53	of 2" Dia Pipe driven to refusal
	B.M. #10	11.825	1046	15	10/29/53	with a 3"x3"x3/8" Piece of Iron
	B.M. #11	10.782	1046	15	10/29/53	with a ½" Dia by ½" High Brass
	B.M. #12	12.365	1046	15	10/29/53	knob on it, welded to the pipe
[illegible]	[illegible]	[illegible]	1036	17	11/11/53	H & N Disc in Conc Cube
	B.M. #1	[illegible]	1036	17	11/11/53	H & N Disc in Half Barrel of Concrete
	B.M. #2	[illegible]	1036	17	11/11/53	Do
	B.M. #3	[illegible]	1036	17	11/11/53	Do
[illegible]	Tria Sta [illegible] (USN Baja)	5.29	1036	17	11/11/53	USN Survey Disc in 10" Block of Concrete
	B.M. #1	4.89	1036	17	11/11/53	H & N Disc in Concrete
	B.M. #2	4.09	1036	17	11/11/53	H & N Disc in Conc filled Half Barrel
	B.M. #3	5.20	1036	17	11/11/53	Do
[illegible]	[illegible]					
	[illegible]	[illegible]	1036	27	12/ 3/53	Bolt in 10" Square Conc Block
	Tria Sta [illegible]	[illegible]	1036	27	12/ 3/53	H & N Disc in 3' Conc Cube
	B.M. #1	[illegible]	1036	27	12/ 3/53	H & N Disc in Conc filled Half Barrel
	B.M. #2	[illegible]	1036	27	12/ 3/53	Do
[illegible]	Tria Sta Zebra (USN Oruk)	[illegible]	1049	5	12/26/53	H & N Disc in Conc Sq
	R.M. #1	6.90	1049	5	12/26/53	H & N Disc in Conc Filled Half Barrel
	R.M. #2	6.26	1049	5	12/26/53	Do
	R.M. #3	7.155	1049	5	12/26/53	Do
ALFA	Tria Sta Alfa (USN Boku)	9.42	1049	8	12/28/53	USN Survey Disc in 10" Block of Concrete
	R.M. #1	6.57	1049	8	12/28/53	H & N Disc in Conc Filled Half Barrel
	R.M. #2	6.35	1049	8	12/28/53	Do
	R.M. #3	6.67	1049	8	12/28/53	Do
BRAVO	Tria Sta Bravo (USN Boro)	6.76	1036	30	12/ 9/53	USN Survey Disc in Conc Block
	R.M. #1	5.14	1036	30	12/ 9/53	H & N Disc in Conc Filled Half Barrel
	R.M. #2	4.13	1036	30	12/ 9/53	Do
	R.M. #3	4.96	1036	30	12/ 9/53	Do

[illegible]

BIKINI ATOLL, MARSHALL ISLANDS

1957

This [illegible] was [illegible] by the Pacific, Coastal and Geodetic Pacific Ocean, and Tarawa Quad, 1957, and plotted by the U.S. Department of Commerce, Coast and Geodetic Survey.

Datum, or zero of depths, is defined by the chart sold reading as follows: "Heights are referred to the datum of soundings, the lowest tide observed of the normally semi-diurnal tide below mean sea level. See explanation for Bikini Atoll, Marshall Islands."

The meridian is oriented to Geographic North, the declination 180 degrees east. The following information appears in the chart title: Tidal differences and ranges:

	Lat.	Long.	Time	Ranges	
				Mean	Great
Bikini Atoll	[illegible]	[illegible]	[illegible]	3.4'	4.5'

Range is the difference between successive ebbs, low, between a high and a low or a low and a high. Mean range is the average range of all tides in the year. Spring tides are the two days each month (approximately 14 days) when the high and low tides are greatest.

The values in this publication are based on average weather conditions. Unusual weather, particularly high winds from a direction other than normal, affect both the times and the heights.

Each side of the chart has a system of figures for time and heights of high and low. This is interpreted for the particular purpose in the legend. The water level on the reference plane is always less than most of the tides, the difference varying from [illegible] for [illegible].

[illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

[illegible]

[illegible]

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0403	H 4.4	9	0951	H 3.6	17	0138	H 5.0	25	----	----
Tu	0952	L 0.8	W	0746	H 3.9	Th	0909	L 0.4	F	0504	L 2.1
	1615	H 5.3		1433	L 2.1		1610	H 6.2		1315	H 3.9
	2249	L 0.4		1954	H 3.7		2301	L-0.3		1930	L 2.2
2	0435	H 4.5	10	0021	L 1.6	18	0115	H 4.2	26	0102	L 3.2
W	1031	L 0.2	Th	1009	H 3.8	F	1015	L 0.3	Sa	0629	L 2.1
	1643	H 5.6		1635	L 2.3		1729	H 6.1		1335	H 4.2
	2309	L 0.3		2240	H 3.4		2423	L 0.0		2032	L 1.8
3	0504	H 4.6	11	----	----	19	0442	H 4.3	27	0811	H 3.5
Th	1056	L 0.2	F	0651	L 1.2	Sa	1139	L 0.0	Su	0753	L 1.8
	1715	H 5.6		1349	H 4.0		1810	H 5.6		1434	H 4.6
	2339	L 0.3		1935	L 2.1		----	----		2100	L 1.4
4	0535	H 4.5	12	0015	H 3.4	20	0006	L 0.2	28	0851	H 3.8
F	1126	L 0.6	Sa	0622	L 1.6	Su	0701	H 5.0	M	0836	L 1.4
	1745	H 5.4		1905	H 4.3		2032	L 0.6		1500	H 5.0
	----	----		2026	L 2.1		1434	H 5.3		2130	L 1.0
5	0007	L 0.4	13	0536	H 3.5	21	0106	L 0.6	29	0924	H 4.2
Sa	0600	H 4.6	Su	0709	L 1.7	M	0717	H 4.7	Th	0910	L 1.1
	1157	L 1.0		1404	H 4.2		1353	L 0.3		1521	H 5.3
	1815	H 5.2		2006	L 1.8		1914	H 4.8		2157	L 0.7
6	0036	L 0.8	14	0639	H 4.1	22	0243	L 0.4	30	0552	H 4.5
Su	0647	H 4.8	M	0809	L 1.0	Tu	0826	H 4.4	W	0946	L 0.9
	1239	L 1.0		1502	H 4.5		1458	L 0.6		1602	H 4.5
	1857	H 4.9		2116	L 0.6		2037	H 4.1		2234	L 0.3
7	0130	L 1.0	15	0814	H 4.6	23	0336	L 0.3	31	0621	H 4.7
M	0718	H 4.8	Su	0908	L 0.7	W	0955	H 4.5	Th	1035	L 0.7
	1330	L 1.0		1552	H 4.6		1608	L 0.2		1639	H 5.6
	1924	H 4.8		2158	L 0.3		2108	H 5.0		2250	L 0.4
8	0140	L 1.0	16	0856	H 4.8	24	0332	L 0.2			
Tu	0753	H 4.8	M	0948	L 0.5	Th	1007	H 5.0			
	1347	L 1.0		1630	H 4.7		1711	L 0.4			
	1950	H 4.7		2236	L 0.2		2145	H 5.2			

[illegible]

[illegible]	[illegible]	[illegible]
9	0719	1555
10	0721	1603
29	0723	1556
31	0725	1550

[illegible] PEARL HARBOR, HAWAIIAN ISLANDS

[illegible] FOR JANUARY 1957

[illegible] & DAYLIGHT SAVING, ADDED TO STANDARD TIME

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0449	H 4.[illegible]	9	[illegible]	L 0.[illegible]	17	[illegible]	H 5.6	25	0211	H 3.4
F	1044	L 0.[illegible]	Th	[illegible]	H 4.[illegible]	Th	[illegible]	L 0.3	S	0745	L 0.1
	1657	H 5.[illegible]		[illegible]	L 0.[illegible]		[illegible]	H 5.5		1409	H 4.4
	2316	L 0.[illegible]		[illegible]	H 5.[illegible]		----	----		2045	L 1.6
2	0516	H 5.[illegible]	10	----	----	18	[illegible]	L 0.2	26	0242	H 3.9
Sa	1113	L 0.[illegible]	Su	[illegible]	H 4.[illegible]	F	[illegible]	H 5.5	Su	0850	L 1.7
	1723	H 5.[illegible]		[illegible]	H 4.[illegible]		[illegible]	H 5.4		1444	H 4.6
	2341	L 0.[illegible]		[illegible]	L 0.[illegible]		[illegible]	H 5.3		2110	L 1.8
3	----	----	11	[illegible]	H 5.[illegible]	19	[illegible]	L 0.[illegible]	27	0910	H 4.3
Su	0543	H 5.[illegible]	M	[illegible]	L 1.[illegible]	Sa	[illegible]	H 5.[illegible]	M	0931	L 1.3
	1141	L 0.[illegible]		[illegible]	H 4.[illegible]		[illegible]	L 0.5		1514	H 5.1
	1750	H 5.[illegible]		[illegible]	L 1.[illegible]		[illegible]	H 5.[illegible]		2145	L 1.9
4	0006	L 0.[illegible]	12	[illegible]	H 4.3	20	[illegible]	L 1.0	28	0235	H 4.7
M	0611	H 4.[illegible]	Tu	[illegible]	L 1.[illegible]	Su	[illegible]	H 4.[illegible]	Tu	0932	L 1.0
	1210	L 0.[illegible]		[illegible]	H 5.[illegible]		[illegible]	H 5.[illegible]		1542	H 5.4
	1818	H 5.[illegible]		[illegible]	L 0.[illegible]		[illegible]	H 4.[illegible]		[illegible]	L 1.6
5	0032	L 0.[illegible]	13	[illegible]	H 4.6	21	[illegible]	L 1.[illegible]			
Tu	0639	H 4.[illegible]	W	[illegible]	L 0.[illegible]	Th	[illegible]	H 4.[illegible]			
	1241	L 1.[illegible]		[illegible]	H 5.[illegible]		[illegible]	L 0.[illegible]			
	1842	H 4.[illegible]		[illegible]	L 0.[illegible]		[illegible]	H 5.6			
6	0059	L 1.[illegible]	14	[illegible]	H 4.[illegible]	22	[illegible]	L 0.[illegible]			
W	0712	H 4.[illegible]	Th	[illegible]	L 0.[illegible]	F	[illegible]	H 5.[illegible]			
	1316	L 1.[illegible]		[illegible]	H 4.[illegible]		[illegible]	L 0.[illegible]			
	1918	H 4.[illegible]		[illegible]	L 0.[illegible]		[illegible]	H 5.[illegible]			
7	0131	L 1.[illegible]	15	[illegible]	H 4.[illegible]	23	[illegible]	L 0.[illegible]			
Th	0752	H 4.[illegible]	F	[illegible]	L 0.[illegible]	Sa	[illegible]	H 5.[illegible]			
	1404	L 1.[illegible]		[illegible]	H 4.[illegible]		[illegible]	L 0.[illegible]			
	1958	H 4.[illegible]		[illegible]	L 0.[illegible]		----	----			
8	0214	L 1.[illegible]	16	[illegible]	H 4.6	24	[illegible]	H 5.[illegible]			
F	0854	H 4.[illegible]	Sa	[illegible]	L 0.[illegible]	Su	[illegible]	L 0.[illegible]			
	1523	L 0.[illegible]		[illegible]	H 4.[illegible]		[illegible]	H 5.[illegible]			
	2109	H 4.[illegible]		[illegible]	L 0.[illegible]		[illegible]	L 0.[illegible]			

DAY	SUNRISE	SUNSET
1	[illegible]	1650
15	[illegible]	1720
31	[illegible]	1755

1 of 3

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0401	H 5.7	2	0036	L 1.7	17	0126	H 4.9	26	0054	H 5.1
F	1000	L 0.4	Sa	0646	H 4.4	Su	0742	L 0.0	M	0547	L 0.8
	1608	H 5.6		1402	L 0.7		1403	H 5.7		1227	H 5.9
	2229	L 0.4		2040	H 5.6		2054	L 0.1		1925	L -0.1
2	0428	H 5.5	18	0054	L 1.1	19	0200	H 5.0	27	0147	H 5.5
Sa	1027	L 0.4	Su	0656	H 4.1	M	0759	L 0.2	Tu	0725	L 0.4
	1634	H 5.6		1418	L 1.0		1418	H 5.6		1336	H 5.2
	2247	L 0.4		2105	H 5.2		2116	L 0.1		2010	L 1.7
3	0451	H 5.4	19	0141	L 1.5	20	0251	H 5.0	28	0218	H 4.9
Su	1054	L 0.4	M	0801	H 3.9	Tu	0918	L 0.5	W	0838	L 0.8
	1700	H 5.5		1440	H 4.3		1440	H 5.7		1613	H 4.6
	2311	L 0.4		2138	L 1.9		2138	L 0.1		2048	L 1.4
4	0516	H 5.4	20	0212	L 2.1	21	0324	H 5.0	29	0243	H 4.9
M	1122	L 0.4	Tu	0908	H 3.9	W	0947	L 0.5	Th	0941	L 0.8
	1736	H 5.4		1502	H 4.3		1502	H 5.7		1644	H 4.9
	2339	L 0.5		2208	L 1.9		2208	L 0.2		2101	L 1.3
5	0542	H 5.4	21	0245	L 2.1	22	0357	H 5.0	30	0309	H 4.9
Tu	1150	L 0.4	W	1002	H 3.9	Th	1014	L 0.5	F	1010	L 1.1
	1752	H 5.4		1526	H 4.3		1526	H 5.7		1713	H 5.2
	2359	L 0.7		2234	L 1.8		2234	H 4.9		2129	L 1.4
6	----	-----	23	0318	H 4.9	24	0431	L 1.5	31	0339	H 4.8
W	0610	H 5.3	Th	0937	L 0.7	F	1051	H 4.8	Sa	1048	L 1.3
	1221	L 0.9		1551	H 4.7		1551	L 0.9		1743	H 5.0
	1820	H 4.8		2158	L 0.5		2158	H 5.2		2156	L 1.4
7	0026	L 0.9	24	0406	H 4.4	25	0510	L 1.8	1	0409	H 4.6
Th	0642	H 5.2	F	1029	L 0.9	Sa	1127	H 4.8	Su	1126	L 1.5
	1256	L 1.3		1640	H 4.6		1636	L 1.0		1743	H 4.9
	1852	H 4.6		2236	L 0.8		2236	H 4.9		2216	L 1.6
8	0056	L 1.3	25	0501	H 4.2	26	0559	L 2.1			
F	0720	H 4.8	Sa	1040	L 0.9	Su	0956	H 4.8			
	1341	L 1.7		1801	H 4.6		1714	L 1.3			
	1933	H 4.9		2330	L 0.9						

DAY	SUNRISE	SUNSET
1	0633	1655
15	0627	1709
31	0603	1724

[illegible] TIDAL [illegible]

[illegible] 1957

[illegible] HARBOR, [illegible] [illegible]

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0420	H 5.7	9	0553	H 5.4	17	0721	H 6.0	25	0459	H [illegible]
M	1034	L 0.4	Tu	1132	H 6.3	W	1402	L 0.6	Th	0731	L [illegible]
	1643	H 5.4		1640	L 1.8		1700	H 5.9		1124	H [illegible]
	2238	L 0.4		[illegible]	[illegible]		2342	L 0.5		1645	L [illegible]
2	0530	H 5.8	10	0004	H 5.9	18	[illegible]	[illegible]	26	0559	H [illegible]
Tu	1144	L 0.3	F	0645	L 1.6	Th	0733	H 6.7	F	0838	L [illegible]
	1702	H 5.7		1248	H 6.6		1416	L 0.0		1405	H [illegible]
	2354	L 0.7		1919	L 1.2		1930	H 6.3		2013	L [illegible]
3	0638	H 5.8	11	0047	H 6.5	19	0832	H [illegible]	27	0733	H [illegible]
W	1254	L 0.2	Sa	0726	L [illegible]	F	0936	L 0.1	Su	0940	[illegible]
	1716	H 5.9		1337	H 6.9		1516	H [illegible]		1520	M [illegible]
	2351	L 0.7		2001	L 0.9		2041	L [illegible]		2046	L [illegible]
4	0734	H 5.7	12	0136	H 6.1	20	0934	H [illegible]	28	0830	H [illegible]
Th	1358	L 0.2	Su	0819	L 0.2	Sa	0940	H [illegible]	Tu	0913	L [illegible]
	[illegible]	H 6.1		1440	H 6.4		1557	L [illegible]		1551	H [illegible]
	----	----		2052	L 0.6		[illegible]	H [illegible]		2114	L [illegible]
5	0002	H 5.9	13	0220	H 5.6	21	0951	L [illegible]	29	1028	H [illegible]
F	0615	H 5.8	Su	0906	L 0.2	Su	0954	H [illegible]	M	0954	L [illegible]
	1443	L 0.2		1529	H 6.2		1618	L [illegible]		1648	H [illegible]
	2058	H 5.8		2139	L 0.4		2217	H [illegible]		2240	L [illegible]
6	0048	H 5.8	14	0259	H 6.0	22	0937	L [illegible]	30	0757	H [illegible]
Sa	0701	H 6.0	M	0954	L 0.3	M	0954	H [illegible]	Tu	1021	L [illegible]
	1529	L 0.6		1557	H 5.6		1718	L [illegible]		1613	H [illegible]
	2138	H 5.9		2204	L 0.8		2314	H [illegible]		2311	L [illegible]
7	0113	H 5.8	15	0318	L 0.0	23	0133	[illegible]			
Su	0743	H [illegible]	Tu	1031	L 0.2	Th	1047	L [illegible]			
	1614	L 0.6		1629	H 5.6		1814	L [illegible]			
	2218	H 5.8		2254	L 0.8		[illegible]	[illegible]			
8	0221	L [illegible]	16	0347	H 6.0	24	0217	H [illegible]			
M	0825	H [illegible]	W	1107	L 0.3	W	0838	L [illegible]			
	1654	L 0.6		1706	H 5.6		1911	H [illegible]			
	2303	H 5.8		2346	L 0.8		1959	L [illegible]			

DAY	[illegible]	[illegible]
1	0655	1902
15	0649	1939
30	0641	1946

[illegible] TIDES, [illegible]

[illegible] TIME ZONE (PST) 1957

[illegible] & NAVAL BASE, SAN DIEGO, CALIFORNIA

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0428	H 6.4	9	0537	H 4.9	17	0146	H 5.7	25	0112	H 4.[illegible]
W	1048	L 0.4	Sa	0614	L 0.0	F	1423	L 1.0	Su	0735	L 0.2
	1643	H 5.3		1329	H 4.5		2127	H 6.4		1316	H 4.7
	2251	L 0.7		1902	L 0.6		[illegible]	L 0.4		1928	L 1.4
2	0458	H 6.0	10	0010	H 4.6	18	0200	H 6.4	26	0145	H 4.7
Th	1129	L 0.6	Su	0648	L 0.6	Sa	1451	L 0.5	M	0810	L 1.4
	1719	H 6.1		1326	H 4.7		2154	H 6.1		1402	H 4.4
	2314	L 0.6		1941	L 1.2		---	---		2016	L 1.3
3	0534	H 5.9	11	0140	H 5.4	19	0258	H 6.2	27	0218	H 5.0
F	1201	L 0.8	Su	0814	L 1.0	Su	0455	L 0.9	M	0859	L 1.4
	1756	H 6.1		1428	H 4.9		2101	L 0.7		1441	H 4.6
	2349	L 0.9		2029	L 0.9		2206	H 5.9		2051	L 1.4
4	----	----	12	0240	H 5.6	20	0358	H 6.0	28	0308	H 5.0
Sa	0612	H 5.6	Su	0859	L 0.8	M	0454	L 0.6	Tu	0945	L 1.4
	1244	L 1.1		1528	H 5.0		1402	H 5.2		1518	H 4.7
	1829	H 6.1		2103	L 0.7		2202	L 0.6		2130	L 0.7
5	0029	L 1.4	13	0351	H 5.9	21	0435	L 0.3	29	0355	H 5.2
Su	0657	H 5.3	M	0939	L 0.6	Tu	1505	H 5.5	W	1031	L 0.2
	1333	L 1.4		1626	H 5.2		2304	L 0.3		1556	H 4.9
	1921	H 6.2		2156	L 0.6		---	---		2150	L 0.5
6	0119	L 1.4	14	0436	H 6.1	22	0440	L 0.2	30	0433	H 6.0
M	0739	H 4.8	Tu	1014	L 0.5	W	0545	H 5.9	Th	1058	L 0.4
	1441	L 1.4		1716	H 5.3		1545	L 0.3		1648	H 4.2
	2014	H 5.7		2240	L 0.6		2348	L 0.4		2247	L 0.7
7	0215	L 1.2	15	0520	H 6.2	23	0540	L 0.2	31	0548	H 6.1
Tu	0821	H 4.4	W	1053	L 0.4	Th	1616	H 5.8	F	1159	L 0.4
	1601	L 1.0		1757	H 5.4		2132	L 0.4		1742	H 4.4
	2211	H 5.7		2321	L 0.5		---	---		2338	L 0.6
8	0429	L 0.9	16	0602	H 6.0	24	0637	L 0.3			
W	1056	H 4.6	Th	1132	L 0.3	F	0036	H 5.6			
	1746	L 1.0		1837	H 5.7		1720	L 0.5			
	---	---		2359	L 0.4		2302	H 5.6			

DAY	SUNRISE	SUNSET
1	0659	1703
15	0656	1719
23	0652	1736
31	0648	1753

[illegible] Atoll, Marshall Islands

[illegible]

[illegible]

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	2527	H 6.0	9	0025	H 4.9	17	0001	H 5.4	25	0459	H 5.7
Sa	1155	L 0.7	Su	0708	L 1.5	M	0617	L 0.2	Tu	0944	L 2.4
	1755	H 4.6		1303	H 4.8		1238	H 5.1		1419	H 4.7
	2345	L 2.0		1904	L 1.9		1854	L 1.0		2033	L 1.4
2	0038	H 5.6	10	0258	H 5.3	18	0151	H 5.7	26	0602	H 5.4
Su	1242	L 0.9	M	0847	L 1.2	Tu	0701	H 4.8	W	0950	L 1.7
	2035	H 4.5		1441	H 4.6		1336	L 0.4		1554	H 4.4
	----	----		1946	L 2.0		1934	L 1.0		2056	L 1.4
3	0129	H 5.4	11	0433	H 5.6	19	0235	H 5.9	27	0700	H 5.3
M	1454	L 0.4	Tu	0935	L 0.9	W	0749	H 4.8	Th	0956	L 1.0
	2337	H 4.5		1522	H 4.7		1427	L 0.7		1944	H 4.4
	2021	L 1.8		2014	L 0.9		2028	H 5.0		2057	L 0.7
4	0121	H 5.6	12	0528	H 5.8	20	0329	H 6.1	28	0749	H 6.1
Tu	0745	L 0.3	W	1007	L 0.8	Th	0837	H 4.8	F	1010	L 0.7
	1424	H 5.4		1558	H 4.8		1510	L 0.2		1603	H 4.4
	2034	L 1.4		2059	L 0.9		2123	H 5.0		2059	L 0.
5	0227	H 5.9	13	0609	H 5.9	21	0418	H 6.5	29	0840	H 6.1
W	0857	L 0.2	Th	1042	L 0.7	F	0929	H 5.0	Sa	1058	L 0.1
	1535	H 5.4		1624	H 4.8		1617	L 0.0		1705	H 4.4
	2154	L 1.0		2141	L 0.9		2218	H 5.0		2156	L 0.
6	0358	H 6.0	14	0647	H 6.0	22	0501	H 6.6	30	0930	H 6.1
Th	1011	L 0.2	F	1119	L 0.6	Sa	1050	H 5.2	Su	1148	L 0.1
	1658	H 5.7		1703	H 4.8		1717	L 0.0		1802	H 4.4
	2322	L 0.9		2403	L 1.0		[illegible]	[illegible]		2241	L 0.
7	0539	H 6.2	15	0659	H 6.2	23	0604	H 6.7			
F	1142	L 0.3	Sa	1158	L 0.5	Su	0651	L 0.2			
	1757	H 5.7		1754	H 4.8		1752	H 5.2			
	----	----		2334	L 1.1		1836	L 1.4			
8	0726	H 6.1	16	0556	H 6.3	24	0702	H 6.6			
Sa	1239	L 0.3	Su	1243	L 0.0	M	0744	L 0.4			
	1855	H 5.6		1838	H 4.8		1818	H 5.0			
	1736	L 1.4		[illegible]	[illegible]		1858	L 1.6			

DAY	[illegible]	[illegible]
1	0033	1242
15	0634	1923
29	0636	1923

[illegible]

[illegible]

[illegible]

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0651	H 4.9	9	0207	H 5.0	17	0126	H 4.3	25	0035	H 5.3
M	1223	L 0.9	Th	0842	L 1.4	Tu	0759	H 5.0	Th	0837	L 1.3
	1834	H 4.9		1455	H 5.0		1402	L 1.1		1452	H 4.4
				2054	L 1.2		1956	H 4.8		2045	L 1.7
2	0725	L 0.9	10	0250	H 5.3	18	0201	L 1.6	26	0055	H 5.0
Tu	0944	H 5.6	F	0928	L 1.3	W	0826	H 4.7	F	0937	L 0.8
	1311	L 0.8		1527	H 4.9		1451	L 1.4		1534	H 4.3
	1915	H 4.6		2134	L 1.2		2030	H 4.5		2139	L 0.4
3	0113	L 2.0	11	0332	H 5.3	19	0237	L 1.9	27	0049	H 6.1
W	0750	H 5.1	Sa	0957	L 0.9	F	0910	H 4.3	Sa	1016	L 0.3
	1351	L 1.1		1600	H 4.8		1506	L 1.6		1615	H 5.1
	2002	H 4.4		2146	L 1.0		2057	H 4.2		2216	L 0.4
4	0209	L 1.6	12	0410	H 5.2	20	0319	L 1.9	28	0128	H 6.1
Th	0821	H 4.7	Su	1030	L 0.8	Sa	0954	H 4.9	Su	1053	L 0.1
	1430	L 1.3		1633	H 4.6		1544	L 1.9		1654	H 5.0
	2111	H 4.5		2215	L 0.9		2140	H 4.6		2253	L 0.5
5	0321	L 1.9	13	0502	H 5.0	21	0403	L 1.4	29	0208	H 6.0
F	0926	H 4.7	M	1100	L 0.7	Su	1036	H 4.6	M	1130	L 0.1
	1556	L 1.3		1704	H 4.7		1627	L 2.1		1733	H 5.0
	2235	H 4.5		2248	L 0.9		2224	H 4.49		2337	L 0.5
6	0533	L 2.0	14	0551	H 5.7	22	0502	L 2.0	30	0247	H 6.0
Sa	1052	H 5.5	Tu	1152	L 0.7	M	1140	H 4.7	Th	1206	L 0.1
	1716	L 1.5		1826	H 4.7		1724	L 2.0		1810	H 5.0
	2358	H 4.3		2340	L 0.9						
7	0639	L 2.1	15	0646	H 5.6	23	0610	L 2.0	31	0323	L 0.
Su	1226	H 5.7	W	1251	L 0.8	Tu	1247	H 4.9	W	0826	H 5.0
	1833	L 1.6		1928	H 4.7		1824	L 2.0		1843	L 0.6
										1905	H 5.1
8	0117	H 4.6	16	0659	H 5.4	24	0548	L 1.8			
M	0752	L 1.2	Th	1252	L 0.9	W	0813	H 5.0			
	1347	H 5.5		1909	H 4.7		1748	L 1.9			
	1934	L 1.6					1907	H 4.7			

DAY	TIME	HEIGHT
1	0652	4.96
16	0643	5.02
26	0654	5.06

[illegible]

[illegible]

[illegible]

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0256	L 1.0	16	0146	H 5.0	17	0048	H 5.6	28	0534	H 6.1
Th	0755	H 4.1	F	0650	L 1.0	Sa	0540	L 0.4	Su	0635	L 0.1
	1328	L 1.0		1257	H 4.6		1153	H 5.1		1257	H 5.5
	1935	H 4.8		1830	L 1.0		1744	L 0.5		1830	L 0.2
2	0345	L 1.4	17	0243	H 5.6	18	0147	H 5.5	29	0619	H 6.2
F	0745	H 4.5	Sa	0638	L 0.7	Su	0535	L 0.3	M	0720	L 0.7
	1404	L 0.4		1328	H 4.8		1231	H 5.3		1329	H 5.4
	2009	H 4.6		1909	L 0.8		1823	H 4.2		2000	L 0.1
3	0424	L 1.2	18	0341	H 5.7	19	0247	H 5.3	30	0700	H 6.1
Sa	0825	H 3.9	Su	0726	L 0.6	M	0631	L 0.5	Tu	0806	L 0.5
	1457	L 1.0		1354	H 5.0		1326	H 5.1		1420	H 5.1
	2135	H 4.7		2040	L 0.7		1943	H 4.0		2057	L 0.2
4	0417	L 1.5	19	0442	H 5.7	20	0350	H 5.4	31	0747	H 6.1
Su	1001	H 3.4	M	0821	L 0.6	Tu	0746	L 0.5	W	0851	L 0.4
	1541	L 1.0		1438	H 5.2		1422	H 5.0		1506	H 5.0
	2232	H 4.7		2131	L 0.7		2038	H 4.0		2154	L 0.3
5	0503	L 1.7	20	0540	H 5.6	21	0448	L 0.4	22	0832	H 6.0
M	1054	H 3.3	Tu	0916	L 0.6	W	0838	H 5.2	Th	0931	L 0.5
	1625	L 1.0		1523	H 5.1		1517	L 0.5		1552	H 5.2
	----	----		2030	L 0.8		----	----		----	----
6	0553	H 4.3	21	0637	H 5.4	22	0546	H 4.7	30	0035	L 0.
Tu	0753	L 2.0	W	1012	L 0.7	Th	0932	L 0.5	F	0949	L 0.
	1342	H 3.6		1708	H 5.1		1610	H 5.0		1635	H 5.
	1927	L 2.0		1929	L 1.0		1837	L 0.5		1951	H 5.
7	0152	H 4.7	22	0649	H 5.2	23	0137	H 4.9	31	0117	L 0.
W	0830	L 1.6	Th	1017	L 0.8	F	0618	L 1.0	Sa	0745	H 5.
	1431	H 3.9		1806	H 4.9		1659	H 4.6		1659	L 1.
	2017	L 2.0		-	-		1836	L 1.0		1923	H 5.
8	0241	H 5.0	23	0057	L 1.0	24	0015	H 5.2			
Th	0910	L 1.2	F	0658	H 4.9	Sa	0827	L 0.7			
	1519	H 4.2		1741	L 1.0		1737	H 5.0			
	2106	L 1.9		1856	H 4.7		1951	L 0.5			

DAY	HOURS	PAGE
1	0256	1
16	0146	1
17	0048	1
28	0534	1

[illegible] ARCH, MARSHALL ISLANDS

[illegible] TIDE TABLES FOR [illegible] 1957

[illegible] & MAJURO, [illegible], LOCATION CORRECTIONS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	[illegible]	[illegible]	2	[illegible]	[illegible]	17	[illegible]	[illegible]	18	[illegible]	[illegible]
Su	[illegible]	[illegible]	M	[illegible]	[illegible]	Th	[illegible]	[illegible]	F	[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
2	[illegible]	[illegible]	10	[illegible]	[illegible]	18	[illegible]	[illegible]	19	[illegible]	[illegible]
M	[illegible]	[illegible]	Th	[illegible]	[illegible]	F	[illegible]	[illegible]	Sa	[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
3	[illegible]	[illegible]	11	[illegible]	[illegible]	19	[illegible]	[illegible]	20	[illegible]	[illegible]
Tu	[illegible]	[illegible]	F	[illegible]	[illegible]	Sa	[illegible]	[illegible]	Su	[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
4	[illegible]	[illegible]	12	[illegible]	[illegible]	20	[illegible]	[illegible]	21	[illegible]	[illegible]
W	[illegible]	[illegible]	Sa	[illegible]	[illegible]	Su	[illegible]	[illegible]	M	[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
5	[illegible]	[illegible]	13	[illegible]	[illegible]	21	[illegible]	[illegible]	22	[illegible]	[illegible]
Th	[illegible]	[illegible]	Su	[illegible]	[illegible]	M	[illegible]	[illegible]	Tu	[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
6	[illegible]	[illegible]	14	[illegible]	[illegible]	22	[illegible]	[illegible]	23	[illegible]	[illegible]
F	[illegible]	[illegible]	M	[illegible]	[illegible]	Tu	[illegible]	[illegible]	W	[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
7	[illegible]	[illegible]	15	[illegible]	[illegible]	23	[illegible]	[illegible]			
Sa	[illegible]	[illegible]	Tu	[illegible]	[illegible]	W	[illegible]	[illegible]			
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]			
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]			
8	[illegible]	[illegible]	16	[illegible]	[illegible]	24	[illegible]	[illegible]			
Su	[illegible]	[illegible]	W	[illegible]	[illegible]	Th	[illegible]	[illegible]			
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]			
	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]			

DAY	CORRECTION	HEIGHT
1	[illegible]	[illegible]
15	[illegible]	[illegible]
29	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0257	L 2.3	9	0510	H 5.3	17	0355	L 0.3	25	0446	H 5.3
Tu	0836	H 5.2	F	0926	L 0.3	Th	1051	H 5.3	F	1044	L 0.4
	1412	L 2.3		1702	H 5.7		1551	L 0.4		1701	H 6.1
	2133	H 5.9		2348	L 0.2		2112	H 4.9		2343	L 0.4
2	0540	L 2.4	10	0607	H 5.3	18	0433	L 1.1	26	0515	H 5.0
W	1202	H 5.1	Sa	1027	L 0.2	S	1127	H 5.2	SU	1153	L 0.6
	1721	L 2.9		1703	H 5.8		1801	L 0.4		1735	H 5.8
	----	-----		2247	L 0.4		----	-----		----	-----
3	0001	H 5.0	11	0434	L 0.2	19	0351	H 4.4	27	0000	L 0.7
Th	0711	L 2.1	S	1046	L 0.6	M	0540	L 0.4	SU	0554	H 4.6
	1327	H 5.6		1650	H 5.8		1151	H 4.2		1449	L 1.7
	1907	L 2.6		2316	L 0.4		1806	L 1.6		1810	H 5.4
4	0115	H 4.9	12	0618	H 5.0	20	0454	L 0.9	28	0659	L 1.2
F	0749	L 1.7	M	1112	L 0.8	TU	0540	H 4.0	M	0630	H 4.1
	1400	H 6.0		1658	H 5.6		1354	H 5.0		1819	L 1.5
	1952	L 2.0		2327	L 0.5		1907	L 1.0		1826	H 4.9
5	0155	H 4.5	13	0650	H 4.7	21	0542	H 5.2	29	0139	L 1.6
Sa	0817	L 1.4	TU	1132	L 1.0	W	0624	L 0.6	TU	0711	H 5.7
	1426	H 6.3		1703	H 5.7		1441	H 5.5		1254	L 1.9
	2025	L 1.5		[illegible]	[illegible]		1958	L 0.9		1923	H 4.4
6	0227	H 4.8	14	0730	L 1.2	22	0645	H 5.4	30	0220	L 2.0
Su	0842	L 1.1	W	0556	H 4.1	TH	0721	L 0.2	W	0811	H 5.3
	1451	H 6.9		1730	L 1.3		1544	H 5.9		1346	L 2.4
	2055	L 1.2		2334	H 5.3		2130	L 0.9		2031	H 4.3
7	0256	H 5.2	15	0817	L 1.6	23	0737	H 5.6	31	0400	L 2.3
M	0907	L 0.8	TH	0640	H 3.9	F	0755	L 0.2	TH	1027	H 5.2
	1516	H 6.1		1756	L 1.6		1651	H 6.2		1514	L 2.7
	2123	L 1.6		1914	H 4.7		2249	L 0.8		2139	H 3.7
8	0323	H 5.2	16	0857	L 1.9	24	0829	H 5.8			
Tu	0932	L 0.6	F	0800	H 3.9	SA	1013	L 0.2			
	1541	H 6.2		1836	L 2.0		1756	H 6.2			
	2151	L 0.7		2043	H 4.2		2356	L 0.2			

DAY	PERIOD	HEIGHT
1	0642	2347
15	0827	1623
29	0948	1936

[illegible]

[illegible] AREA, [illegible] COAST

TIDE TABLE FOR [illegible] 1962

[illegible] & MEARES, [illegible], [illegible] ISLANDS

DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT	DAY	TIME	HEIGHT
1	0559	L [illegible]	9	0127	H 4.2	17	0611	L [illegible]	25	0840	H 4.4
F	1230	H 4.5	Tu	[illegible]	L 0.6	We	[illegible]	H 4.2	M	[illegible]	L 0.9
	[illegible]	L [illegible]		[illegible]	H 5.0		[illegible]	L [illegible]		1755	H 5.5
				[illegible]	L 0.5						
2	[illegible]	H [illegible]	10	0212	H 4.2	18	0001	H 4.4	26	0047	L 0.9
Sa	[illegible]	L [illegible]	Su	[illegible]	L 0.7	Th	0701	L [illegible]	Tu	0840	H 4.1
	[illegible]	H [illegible]		[illegible]	H 5.3		[illegible]	H 4.2		1307	L 1.5
	1919	L [illegible]		[illegible]	L 0.7		[illegible]	L [illegible]		[illegible]	H 5.2
3	0111	H 4.1	11	0258	H 4.1	19	0050	L 0.6	27	0102	L 1.3
Su	0733	L 1.5	M	[illegible]	L 0.9	Fr	0756	H 4.5	W	0938	H 5.8
	1551	H 4.4		1449	H 5.2		[illegible]	L 0.7		1358	L 1.7
	1958	L [illegible]		[illegible]	[illegible]		[illegible]	L [illegible]		[illegible]	H 4.2
4	0151	H 4.1	12	0342	L 0.9	20	0132	H 4.5	28	0245	L 1.2
M	0803	L [illegible]	Tu	0850	H 4.5	S	0835	L [illegible]	Th	0926	H 5.8
	1442	H 4.8		[illegible]	L 0.5		1445	L 0.7		1506	L 2.1
	2041	L 1.5		[illegible]	H [illegible]		[illegible]	L [illegible]		1958	H 4.2
5	0225	H 4.3	13	[illegible]	L [illegible]	21	0214	H 4.5	29	0346	L 1.2
Tu	0831	L 1.0	W	0934	H 4.9	Su	0917	L 0.4	F	0957	H 5.4
	1447	H 5.2		[illegible]	L [illegible]		1536	H 4.9		1426	L 2.4
	2101	L 1.0		[illegible]	H [illegible]		[illegible]	L [illegible]		[illegible]	H [illegible]
6	0256	H 4.3	14	[illegible]	L [illegible]	22	[illegible]	H [illegible]	30	0436	L 2.0
W	0859	L 0.8	Th	0959	H [illegible]	Su	0959	L 0.4	M	1042	H 5.4
	1515	H 5.5		[illegible]	L [illegible]		1630	H 4.9		1530	L 2.5
	2131	L 0.7		[illegible]	H [illegible]		[illegible]	L [illegible]		2220	H [illegible]
7	0326	H 4.3	15	[illegible]	L [illegible]	23	0038	H 4.7			
Th	0926	L 0.6	F	0947	H [illegible]	M	[illegible]	L 0.4			
	1543	H 5.7		[illegible]	L [illegible]		1654	H [illegible]			
	2201	L 0.6		[illegible]	H [illegible]		[illegible]	L 0.4			
8	0356	H 4.2	16	0008	H [illegible]	24	0036	H 4.7			
F	0955	L 0.6	Sa	[illegible]	L [illegible]	Tu	[illegible]	L 0.4			
	1610	H 5.8		[illegible]	H [illegible]		[illegible]	H [illegible]			
	2233	L 0.6		[illegible]	H [illegible]		[illegible]	L [illegible]			

DAY	SUNRISE	SUNSET
1	0554	1654
15	0603	1741
31	0609	1830

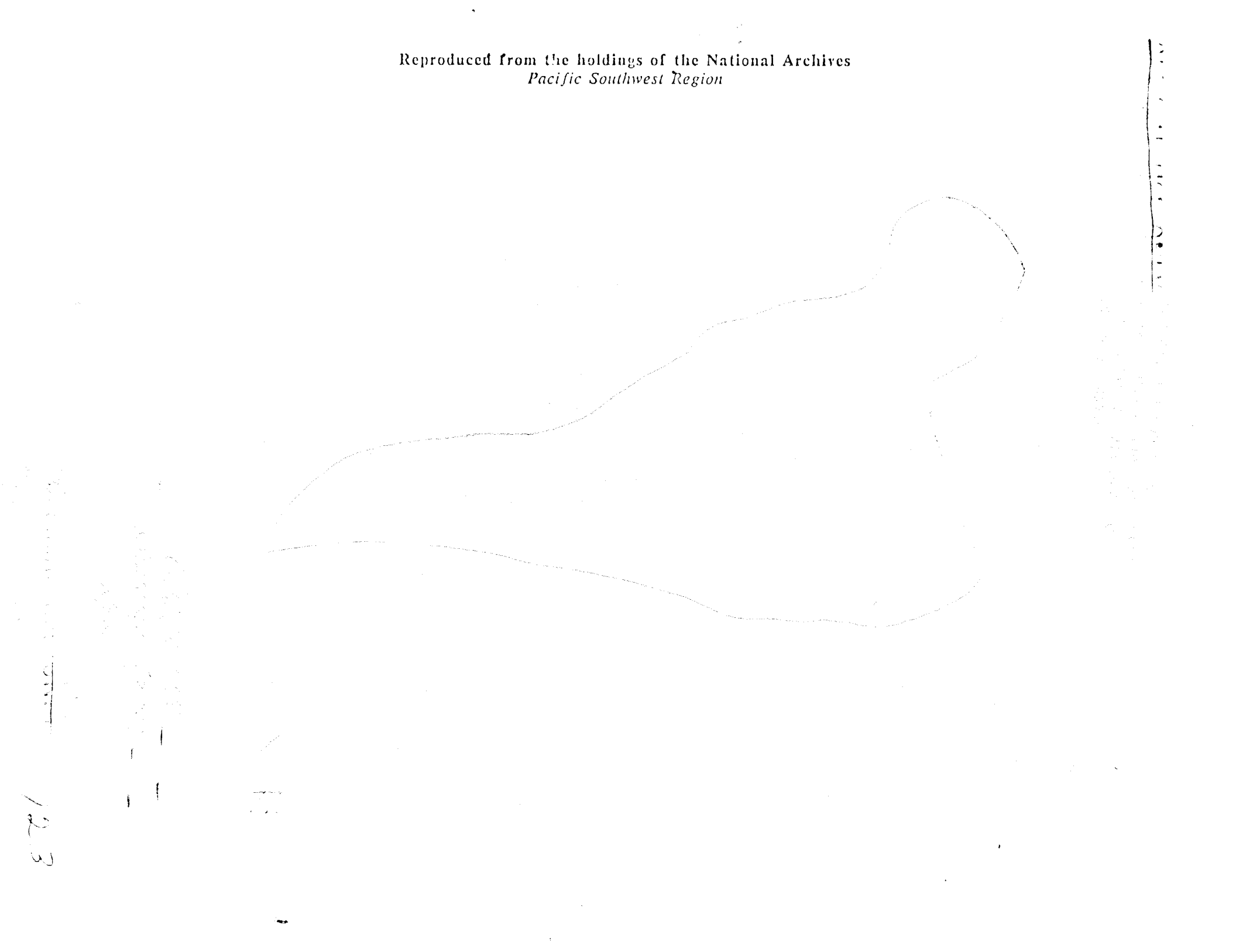
[redacted]

Tu	2017	H 1.2	W	0054	H 4.4	Su	0054	H 4.2	27	0112	L 2.1
	1435	L 0.2		1008	L 0.2		0644	L 0.2	F	0716	H 4.6
	2042	H 4.7		1614	H 5.4		1242	H 4.7		1305	L 1.4
							1912	L 0.7		1937	H 4.5
4	0152	H 4.0	12	0018	L 0.8	20	0056	H 4.4	28	0140	L 1.4
W	0826	L 1.2	Th	0626	H 4.2	M	0640	L 0.7	Sa	0756	H 3.9
	1423	H 4.9		1240	L 0.8		1250	H 4.7		1315	L 2.0
	2042	L 0.7		1836	H 5.0		1904	L 0.7		1956	H 4.0
5	0232	H 4.2	13	0112	L 0.1	21	0142	H 4.6	29	0232	L 1.2
Th	0903	L 1.0	F	0719	H 4.0	Tu	0726	L 0.6	Su	0836	H 3.9
	1452	H 5.3		1334	L 0.5		1330	H 4.8		1450	L 2.3
	2112	L 0.5		1925	H 5.6		1950	L 0.4		2046	H 3.6
6	0307	H 4.4	14	0202	L 0.4	22	0229	H 4.6	30	0323	L 1.2
F	0938	L 0.8	Sa	0812	H 4.2	W	0812	L 0.6	M	1029	H 3.6
	1524	H 5.3		1427	L 0.3		1411	H 4.8		1608	L 2.2
	2150	L 0.4		2012	H 5.5		2041	L 0.4		2125	H 3.4
7	0343	H 4.6	15	0253	L 0.6	23	0317	H 4.8	31	0458	L 2.0
Sa	0936	L 0.6	Su	0858	H 4.2	Th	0856	L 0.6	Tu	1150	H 3.8
	1557	H 5.4		1507	L 0.3		1450	H 4.7		1734	L 2.3
	2222	L 0.4		2052	H 5.5		2108	L 0.5			
8	0417	H 4.7	16	0335	L 0.6	24	0356	H 4.8			
Su	1030	L 0.5	M	1001	H 4.2	F	0937	L 0.7			
	1631	H 5.4		1547	L 0.4		1528	H 4.6			
	2259	L 0.4									

Day	Moonrise	Moonset
2	0703	1532
3	0748	1625
4	0835	1720

~~OFFICIAL USE ONLY~~

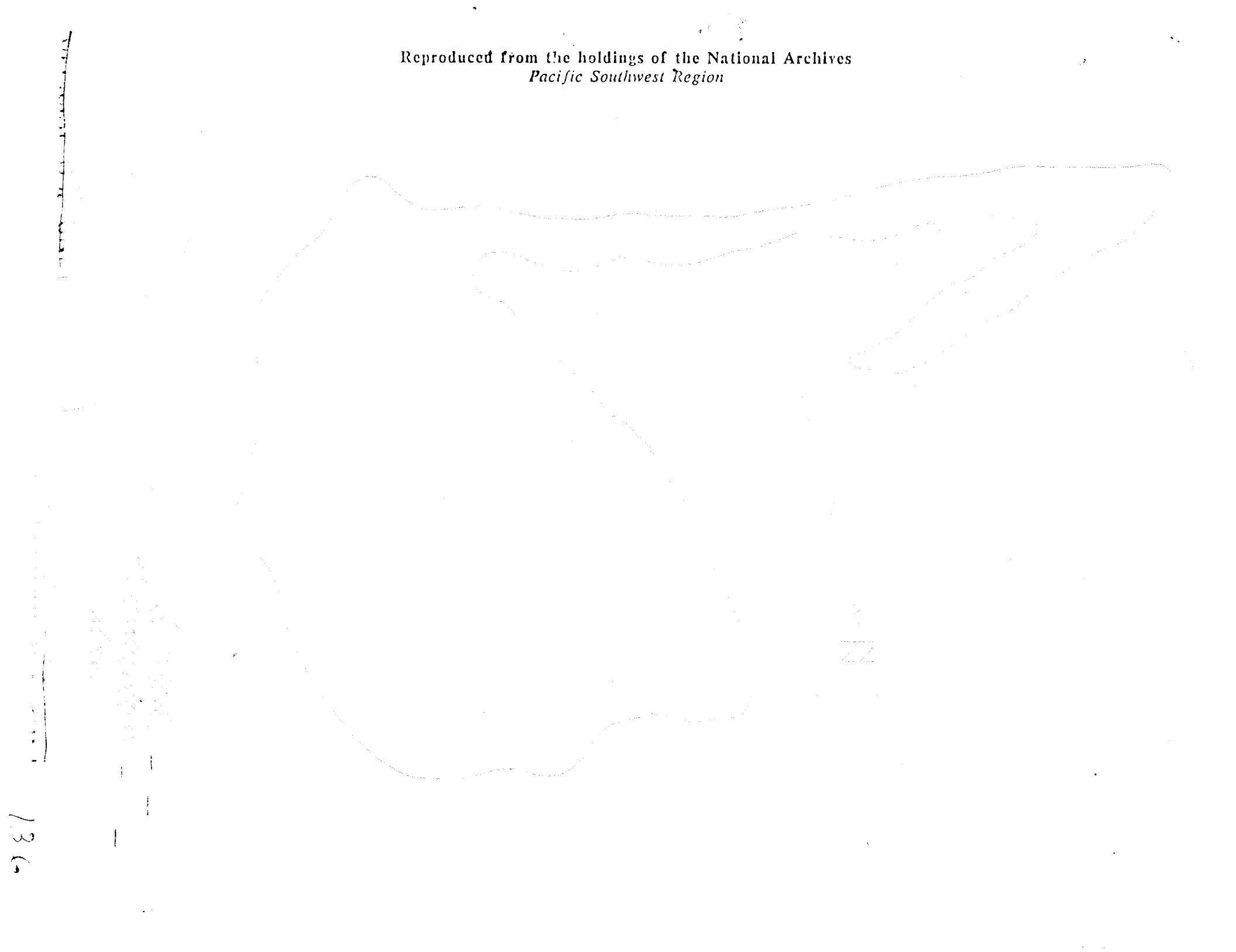
~~OFFICIAL USE ONLY~~



~~OFFICIAL USE ONLY~~

~~OFFICIAL USE ONLY~~

~~OFFICIAL USE ONLY~~



~~OFFICIAL USE ONLY~~

Specifications for Surveys

The basis of classification of geodetic control surveys is the accuracy with which the length and azimuth of a line can be determined. Since it is impossible to ascertain the absolute error, it is assumed that the procedure in executing the survey conforms to standards which have been established as the result of extensive experimentation and research. For this reason, the triangulation surveys of this department will conform to the specifications and methods of the U.S. Coast and Geodetic Survey.

Specifications are prepared for each class of the work and much other information of value is contained in Special Publication No. 247, Manual of Geodetic Triangulation published by the USCGS. This manual will be the textbook for precise surveys, and personnel involved in the work should familiarize themselves with the contents. The following is a summary of the procedure involved in making a survey, and is not intended to replace reference to the manual.

Generally, the degree of accuracy and the stations whose interrelation are required will be specified by the Client. The approximate locations of the triangulation stations will be determined based on reconnaissance and conformance to strength of figure requirements. Instructions including the above information will be issued to the field for execution of the work.

Reconnaissance. Before observing can be established, the stations must be physically established and, if necessary, observing towers erected. Intervisibility of stations must be determined, and the location and height of towers so established that the line of sight has a minimum vertical clearance of ten feet from any object. The minimum safe clearance both vertical and horizontal is dependent on atmospheric conditions, and reference to C.S. 247, Manual of Reconnaissance for Triangulation, is recommended for information on the subject. Formulas and a table for determining intervisibility will be found on Page 17, page [illegible]. The computed heights of towers to compensate for the earth's curvature and refraction plus ten feet will give the actual height of towers.

Reference. The following references are published by the U.S. Coast and Geodetic Survey, should be available in the field where precise triangulation is to be accomplished. The chapters on triangulation found in many textbooks are based on information from these circulars.

C.S. 247, Manual of Geodetic Triangulation
C.S. 248, Manual of Reconnaissance
C.S. 249, Manual of First Order Traverse
C.S. 215, Manual of Second Order Triangulation
C.S. 216, Manual of Intersection Location
C.S. 8, Formulas and Tables for the Computation of Geodetic Positions

C.S. 249 and 247 are supplemented by C.S. 247, but do contain more detail on some subjects.

INSTRUCTIONS FOR USE OF THE [illegible] THEODOLITE

(Issued by the U.S. Coast and Geodetic Survey)

These instructions are prepared for the Wild T-2 Theodolite, but contain information applicable to the Wild T-3.

1. Unpacking and setting up of the instrument. The case is set up with the felt to the rear, and the two lateral screws of the base plate are unscrewed. The hood is then carefully lifted and the two clamping levers are unloosed. The base plate which is fastened to the frame with a milled screw, is taken out and set on the stand, centered, the three levers are pulled out, the theodolite is set in and the tribrach screws are tightened with the clamping levers.

2. Leveling. [illegible] is not necessary anymore by leveling, since the point of support of the plane table is the plane which passes through the tips of the tribrach screws.

The theodolite should be turned several times about the vertical axis and the telescope transmitted before starting [illegible].

3. Focussing. The focussing of the eye piece is done by turning the black milled ring until the crosswires become very sharp and black, while the telescope is pointed on a moderately light background. A person should observe and remember the setting of the ring on the numbered scale, and then use this for future focussing. To focus on the image of the sighting point, turn the nickel focussing ring (testing for freedom of parallax between image and crosswires, by movement of the eyes). For the focussing of the reading microscope, the milled black ocular tube, at the side of the telescope is turned until the graduations of the circle become sharply defined.

By changing eye-pieces, a person may obtain the magnifications of 24, 30 or 40; normally, the magnifying of 30 should be used, and this eye-piece should also be used for the zenith prism.

4. Reading the circle. The horizontal and vertical circles are read in the microscope, adjoining the telescope. To the right, next to the slow motion screw for the vertical circle is the milled head screw for the inverting contrivance. By turning the screw clockwise until the stop, the horizontal circle becomes visible in the microscope, then by turning it counterclockwise the image of the vertical circle becomes visible.

The illumination of the circles should be as bright and as equally illuminated as possible. To do this, the illuminating prisms are turned. During the measurement of an angle, the illumination should not be changed. In the reading microscope appear the images of the diametrically opposite portions of the circle, separated by a fine horizontal line, and below and above the scale image of the second drum.

5. Horizontal circle and the signs. The horizontal circle is graduated to 4 minutes, and is read (after interpolation), by means of the index, to 2 minutes. The lower row of degree figures is read.

To this circle reading be added double the reading of the seconds drum, since the drum is half graduated. The drum is numbered by tenths from 0.0 to 60.0, but this represents intervals of 20 seconds, so that single drum reading is only half the true value and must be multiplied by two before being added to the circle reading. In practice two readings of the drum should be taken and the sum of the two used to the circle reading, thus accomplishing the same result as multiplying the drum reading by two and gaining the added accuracy of two micrometer readings instead of one. The following example will make this clear:

Circle reading		Seconds Drum		Total Reading			
°	'	1st read.	2nd read.	sum	°	'	"
104	58	6.8	6.9	13.7	104	58	13.7
119	10	11.1	10.0	21.1	119	11	22.1
140	20	19.8	20.0	39.8	140	20	39.8
158	30	32.0	31.3	63.3	158	31	06.3
172	52	7.0	7.0	14.0	172	52	14.0
0	12	17.9	17.8	35.7	0	13	35.7
43	28	39.0	39.1	78.1	43	29	18.1

Since only two micrometer readings are used instead of six as in 3-micrometer instruments, greater care and greater refinement of drum readings must be taken with the two readings. This is more readily possible with 2-micrometer theodolites.

The seconds drum reads directly to one-tenth seconds (0.2 seconds) and all readings should be taken to this degree of refinement, record the sum of the two readings, also the mean of direct and reverse readings and the direction to the nearest tenth of seconds.

Experience shows that the difference between two careful micrometer readings will seldom be greater than 0.3 double seconds (0.6 seconds) and generally no more than 0.1 double seconds (0.2 seconds). If the two readings vary by more than 0.3 double seconds, (0.6 seconds), they should be repeated until two concordant readings are obtained.

4. Vertical circle readings. There is a known tendency of the vertical circle, on the majority of theodolites, to read differently in the direct and reverse positions. Always check the vertical circle bubble before reading the circle. The following is an example of the readings:

Direct [illegible]

Reverse [illegible]

Difference (angle of depression) [illegible]

With vertical circle left

Vertical circle readings [illegible] Index [illegible] elevation. depression

With vertical circle right

Vertical circle readings [illegible] Index [illegible] elevation depression

Records. Forms are provided for each specific [illegible] recording the results of observing and computing. These records should be kept on transparencies in order that reproductions can be made of all records of the survey.

All computations which are required to complete these forms should be included in the records of the survey. They should be arranged in an orderly manner, and in sufficient detail that the computations can be checked at the Home Office. References should be made to field books, map projections data used in computing the survey.

7. Electrical Illumination. There are two systems of illumination:

(a) That for the horizontal circle.
(b) That for the vertical circle and cross-wires.

The record drum is illuminated by the light for whichever circle is being read. The horizontal circle lamp is the one which has three wires attached to it: The vertical circle lamp is the one which has two wires. Remove the horizontal and one vertical illumination prism cover. Then in the clips in the base plate of the instrument slide between them the electrical illumination devices.

The cross wires are illuminated by a piece of paper inside the telescope which intercepts part of the light which goes to the vertical circle. This prism has no adjustment.

A rheostat may be installed in the circuit for regulating the cross-wire illumination. Tests should be made to see if it should be installed between the battery and horizontal circle lamp or between the horizontal and vertical circle lamps. When the system of illumination has been finished, a permanent rheostat can be attached if necessary.

To switch off the circuits entirely, pull out one of the small pins at the end of one of the wires of the horizontal circle illuminating attachment.

A very important point is the illumination of the horizontal circle. A diffused light is essential, and this diffusion is not provided by the frosted bulbs, provided with the instrument, to the desirable degree. Bulbs should be painted white, or a piece of paper should be placed over the end of the lamp tube for the illumination of the horizontal circle to give the required diffusion. Permanent changes will be made when field engineers have given the problem their attention. In the meantime a tube of white paint and a bottle of shellac should be carried by field parties painting bulbs.

Flashlight bulbs for circle illumination of either 2.5 or 3.8 volts may be used. The latter will likely be found preferable. Number 6 dry cells will be found more reliable for illumination current than the batteries supplied in a case with some of the instruments. Some bulbs apparently have the wrong screw thread and size of base to fit into the sockets. Before leaving for the field select proper spare bulbs for emergency.

8. Other Points. When not in use keep the horizontal circle, every few nights close the circle to test conditions by closing on the bubble at the end of the half set.

Carry the theodolite upright when in the car; do not let the case rest on its side. The theodolite is designed to be used by the bottom only, and if it rests on its side any length of time will be taken on the upper part of the vertical axis, an undesirable condition.

Laboratory tests indicate that the accuracy of collimation drops considerably when the telescope is not exactly focused. It is therefore desirable to exactly focus the telescope on a star, after the cross wires are focused, and always use the telescope at that focus for precise work. After the exact focus is obtained put a scratch across the edge of the focusing sleeve and the adjacent part of the telescope tube, so that exact focus can be obtained at any time.

9. Description of the theodolite.

Effective aperture of the objective [illegible] (2 3/8 inches)
Magnification (3 eyepieces) [illegible] 23.4 and 38.5
Length of telescope [illegible] mm. (10 inches)
Sensitivity of plate level, [illegible] per division
Sensitivity of vertical circle level, [illegible] per 2 mm.
(The coincidence adjustment of the bubble [illegible] doubles the accuracy of centering.)
Magnification of reading microscope [illegible]
Diameter of horizontal circle [illegible] mm. (6 1/2 inches)
Diameter of vertical circle [illegible] mm. (5 1/4 inches)
Division of horizontal circle to [illegible]
Division of vertical circle to 2 double minutes.
(really 8 minutes)
Value of smallest division of [illegible] seconds, estimated (0.1 seconds, really 0.2 seconds
Vertical circle bubble adjustment acts in the direction of the horizontal wire.

Weight of instrument [illegible] 11.5 kg. (25.3 lbs.)
" " case [illegible] 5.9 kg. (12.9 lbs.)
" " tripod and accessories [illegible] 7.1 kg. (15.5 lbs.)
Resolving power (24X eyepiece) 24
" " (30X ") 30
" " (40X ") 34

10. Zenith prism. This prism is to be used for astronomic observations. The Zenith prism is a [illegible] of the [illegible] The 30 magnification eyepiece is to be used for it.

11. Packing the instrument. The levers of the base plate are released, the instrument is lifted out and set on the base plate of the packing box. In front on one of the supports of the tribrach screws is a nickel mark. A similar mark is on the front piece of the base plate, the instrument must be so set in, that these two marks correspond, then the clamps are closed. The telescope is turned over until the eyepiece almost touches the standards, the standards are turned in the horizontal direction in such a way that the eyepiece comes over the two marks. The clamping screws for the vertical circle and the horizontal circle are moderately tightened. The base plate with the levers pushed in is again attached to the standards or it may be left on the stand. After carefully closing the hood, the two screws for tightening the hood are tightened.

NOTE: Paragraphs 3 and 11 do not apply to the type of instrument now furnished with the T-3 theodolite owned by [illegible]

Specifications of the [illegible] require a set of sixteen positions to be observed for first order triangulation and six to twelve for second order. Recommendations of the local office of this organization are that for average conditions eight positions be observed for second order triangulation.

The initial settings of the circle for the eight and sixteen position sets are as follows. It is not necessary to set the circle nearer than about one-half minute to the setting given.

8 Position

(1)	D	0°	00'	10"
(2)	R	180	00	25
(3)	D	45	00	35
(4)	R	225	00	50
(5)	D	90	00	10
(6)	R	270	00	25
(7)	D	135	00	35
(8)	R	315	00	50

16 Position

(1)	D	0°	00'	10"	(9)	D	90°	00'	10"
(2)	R	180	00	25	(10)	R	270	00	25
(3)	D	45	00	35	(11)	D	135	00	35
(4)	R	225	00	50	(12)	R	315	00	50
(5)	D	22	30	10	(13)	D	112	30	10
(6)	R	202	30	25	(14)	R	292	30	25
(7)	D	67	30	35	(15)	D	157	30	35
(8)	R	247	30	50	(16)	R	337	30	50

After completion of the direct readings on the initial light, direct pointings and readings are made to lights clockwise or additional light of the schedule. Then the telescope is plunged and pointings and readings made on the lights in the reverse order to and including the initial light. This completes position number one. With the telescope remaining reversed, the circle is set for position two, and pointings on the initial and other lights are made in the same manner as for position one. This procedure is repeated until the required number of positions have been observed. The objective sometimes is not observed.

It frequently happens that one or more lights are not visible during all or part of the time that the observations are being made upon the other stations. Little time should be spent waiting for a light to rise. The position missed can be observed later, using the same settings as for the corresponding position of the first series, or some other main scheme of direct observations during the program.

Every effort should be made to complete initial pointings sets to all required stations while occupying a station, as a second occupation will generally mean another night's work if the preceding station is inaccessible.

Rejection of Observations

The greater part of the time involved in the observing program is in preparation to observe, transporting, setting up, adjusting lights, etc. Once ready to go, any refinement in observing which may help to decrease the probability of re-observing a station is well justified. A rigorous application of the rejection limits to observations, even though the observation rejected was just outside the limit, will result in a saving of time and effort.

The following is a summary of rejection rules as applied by the USC & GS, and may be found in more detail in C.& G.S. 247, pages 39, 40 and 41.

(1) Any measurement of a direction deviating by more than four seconds from the mean for first-order triangulation, and by more than five seconds for second order, must be rejected if not observed using the same position setting.

(2) In applying the rejection limit the value of a direction should be rounded off to the nearest tenth of a second, and the criterion applied to each observation to the tenth of a second.

(3) If any observations are so far from the approximate mean as to obviously exceed the limit, these should be rejected before taking the trial mean and thus possibly re-observed.

(4) No reading should be rejected if it is within the limit of retention unless rejected at the time of observation.

(5) A trial mean is taken, and using the rejection limit any observation (including the individual ones forming a position mean) which differs by more than the limit from the trial mean is rejected. The rejected positions are re-observed.

(6) After a trial mean is obtained using the rejection limit applied, none of the observations rejected should be again included even though the new mean would bring them within the limit of rejection.

(7) Using a new mean, the rejection limit is again applied. If any of these observations fall outside the rejection limit they are rejected, and new observations and new means taken until all accepted positions are within the limits of the rejection.

(8) If one reading of two or more observations falls without and one within the limit of rejection, do not use the mean even though it comes within the limit. Use instead only the reading within the limit and reject the other.

(9) If two readings fall without the limit, one being abnormally high and the other abnormally low, and the mean within the limit, both readings should be rejected.

(10) If two or more readings have been taken for a single position, the mean should be used if all readings are within the limit of retention.

(11) Occasionally conditions will be encountered which make it difficult to bring all readings within rejection limits. There will be no abnormal spread in direct and reverse readings, but the position mean will be well within the limit. If the number of rejections is averaging much in excess of ten percent of the entire number of observations, the rejection limit may be increased. Before this is done, an attempt should be made to determine the cause of the large range.

Record of Rejected Directions

The following Record of Rejected Directions contains the field record of observing an eight-position set to accord with specifications. It is followed by an "Abstract of Directions" which contains the position directions and the mean of the eight positions as to directions.

The process of establishing the mean direction of a position may be understood by a study of the records for position No. 4 as follows:

(a) The direct and reverse readings are recorded for each observed station.

(b) The initial and closing direct readings on the initial station are meaned.

(c) The mean reading on the initial station established by a and b is subtracted from the mean D and R for each successive observed station to establish the direction for that position.

A trial mean is established by deducting 20.0" from each of the directions for each of the eight positions by the use of assumed values in this case (see Abstract of Directions) 40.0" for station Baker and 60.0" for station Ivy.

With these trial means each position is checked for compliance with rejection limits. Two examples of rejection follow:

Position No. 4. The trial mean for direction Baker is 40.0". It is obvious that D/R is outside the five-second rejection limit.

The mean D/R for a direction of 40.0 is obtained by subtracting the difference between the direction and trial D/R for Baker at this position, or: 20.0 - (40.0 - 20.0) = 20.0.

It is then found that the direction 20.0 is within limits and that the nearest reading D/R to obtain the limits must be rejected. 21.4 is accepted for the mean D/R.

Position No. 7. The position direction of 45.0 is obviously outside the five-second rejection limit of 60.0. 60.0 - (60.0 - 45.0) = 50.0. The direct and reverse readings of 50.0" and 50.0" are both outside the limits so the position is rejected and is checked (see Abstract of the same page).

In the Abstract of Directions a line is drawn through the original direction for Position 4 of 40.0" and the new direction of 40.0" is entered. The new direction for Position 7 of 45.0 is entered in the same manner.

A new mean direction is established and a check is made of the positions to determine that the directions for all positions and all position means' d's are within the limits of this field work.

It will be found that the records are arranged approximately with most of the successive northern and eastern boundaries which are obviously outside limits. This parallels procedure there existed before establishing a tribal mean, and will result in a reading of obtuse angles. For instance, in the first direction of Unit 'A' (Unit 'A' is surveyed on the first line east of Baker) when a direction of 45 [illegible] was established for the line by a previous survey indicated.

Triangle Closure. [illegible] requirements for triangle closures are that the maximum error in closure of any triangle shall not exceed three seconds for first order, five for second, and ten for third order, and that the average triangle closure where triangulation is being extended by a network of figures shall not exceed one second for first order, three for second and five for third order. (See U. S. C. 247, page xvii.)

Abstract of Directions. An Abstract of Directions will be kept as a part of the observing procedure for each station, and will list the direction for each position, the sum and the mean direction. (U.S. C&GS, pp. 236, 240 to 250.)

List of Directions. The List of Directions will generally list only the mean directions from the initial station to each station. Where an eccentric instrument or light is involved the necessary reduction and corrected direction to the true station will be given. (U.S. C&GS, pages 250 to 257.)

Triangle Computations. The form for triangle computations is set up to record the computation of two triangles on one sheet. The newly used station is always numbered 4, and the other two are 1 and 2 in a clockwise order, with the line 1-2 as the known line. The procedure in computing the triangles is explained in U.S. C&GS, pages 258 to 262.

Spherical Excess. The spherical excess in a figure is not considered in computing a plane triangle, but the spherical angle which is required in computing the geographic position. The spherical angle is larger than the plane angle, and the correction should be computed as explained in U.S. C&GS, pages 262, 263 and 271.

Side Checks. In the computation of a quadrilateral there are always three lines which have two values in lieu of their lengths. One of the requirements of triangulation is that the difference between the two values for the logarithm of the length of a line be no greater than two times the logarithmic difference for one second of the smallest distance angle included in the computation of either value for first order triangulation, and twice the amount for second order.

These side checks are the first indication of the quality of the observed angles, as it is possible for the triangles of a quadrilateral to close within the prescribed limits and not meet the requirements of the side check. The side check condition should be established before the closing of a quadrilateral is considered complete, as re-observing may be necessary.

Side equation tests should be made when the closures are large in order to isolate the direction that is faulty. (See U.S. C&GS, pages 10, 153 to 171, and xvii.)

Geographic Positions. The geographic positions of the stations should be computed at the junction of each quadrilateral and at the terminus of the

previous computations. A description of the [illegible] is given in C.S. 8, Formulae and Tables for Computation of Geodetic Positions. The latitude functions listed therein are necessary in computing the positions. (See also C.S. 247, pages 175 to 179.)

Triangulation Adjustment. The procedures outlined to this point is normally considered as included in the observing and field (or jobsite) computing. Due to the limited extent of the schemes surveyed by this organization, it is generally considered that when the side conditions have been satisfied further adjustment is not practical. On surveys where a coordinate system will be established and it is desirable that the values of a station remain exactly the same, independent of the direction of computation through the net, an additional adjustment is applied.

This refinement results in slight changes in the values, and a full least square adjustment is not considered practical for a limited scheme. A modified adjustment which meets the requirements of small schemes is included in this set of instructions.

HOLMES & NARVER INC. ENGINEERS JOB NO. ____

RECORD OF HORIZONTAL DIRECTIONS

OBSERVER F.P.C INST. NO. 17803 STATION RED

RECORDER G.H.B DATE 11-5-51 SET NO. 1

POSITION	STATIONS OBSERVED	TIME	D/R	CIRCLE READING	MEAN	DIRECTION	REMARKS
1	ABLE	1110 PM	D	00-00-20.0	19.5 +0.5		
			R	180-00-18.9	20.0		
	BAKER		D	74-30-56.5	56.5	36.5	
			R	254-30-56.4			
	FOX		D	163-39-30.6	31.5	11.5	
			R	343-39-32.4			
	ABLE		D	00-00-21.0	21.5 -0.5		
			R	180-00-20.0	20.0		
2	ABLE		D	45-00-50.0	50.7		
			R	225-00-51.5			
	BAKER		D	119-31-32.0	29.0	38.3	
			R	299-31-26.0			
	FOX		D	208-40-00.7	59.7	09.0	
			R	28-39-58.7			
	ABLE		D	45-00-51.2	50.6 +0.1		
			R	225-00-50.0	50.7		
3	ABLE		D	90-01-10.0	11.7		
			R	270-01-13.5			
	BAKER		D	164-31-51.9	51.9	40.2	
			R	344-31-51.9			
	FOX		D	253-40-17.9	17.4	05.7	
			R	73-40-16.9			
	ABLE		D	90-01-13.7	11.8 -0.1		
			R	270-01-10.3	11.7		
4	ABLE		D	135-01-40.0	38.7 +0.6		
			R	315-01-37.3	39.3		
	BAKER		D	209-32-21.6	21.6		
			R	~~29-32-27.5~~	~~24.6~~		REJECT (R)
	FOX		D	298-4[illegible]	480	08.7	
			R	118-4[illegible]			
	ABLE		D	135-01-39.7	39.9 -0.6		
			R	315-01-[illegible]	39.3		
			D				
			R				

FOLME & NARVER ENGINEERS JOB NO

RECORD OF HORIZONTAL DIRECTIONS

OBSERVER F.P.C. INST. NO. 17803 STATION REO

RECORDER G.H.B. DATE 11-5-51 SET NO. 1

POSITION	STATIONS OBSERVED	TIME	D/R	CIRCLE READING	MEAN	DIRECTION	REMARKS
5	ABLE		D	22-00-20.0	174		
			R	202-00-14.8	12.3 / 19.7		
	BAKER		D	96-30-58.4			
			R	276-30-55.8	57.2	37.5	
	FOX		D	185-39-31.8			
			R	05-39-28.9	30.3	10.6	
	ABLE		D	22-00-23.8	21.9		
			R	202-00-20.0	-2.2 / 19.7		
6	ABLE		D	67-00-50.0	49.7		
			R	247-00-49.4	+1.0 / 50.7		
	BAKER		D	141-31-30.6			
			R	321-31-28.8	29.7	39.0	
	FOX		D	230-40-00.6			
			R	50-39-56.7	58.7	08.0	
	ABLE		D	67-00-53.7	51.8		
			R	247-00-50.0	-1.1 / 50.7		
7	ABLE		D	112-01-10.0	10.8		
			R	292-01-11.6	+0.1 / 10.9		
	BAKER		D	186-31-56.0			
			R	06-31-56.2	56.1	45.2	REJECT (SEE BELOW)
	FOX		D	275-40-21.7			
			R	95-40-21.2	21.4	10.5	
	ABLE		D	112-01-12.1	11.0		
			R	292-01-10.0	-0.1 / 10.9		
8	ABLE		D	157-01-14			
			R	337-01-[illegible]			
	BAKER		D	[illegible]			
			R	5-[illegible]	16.0	38.3	
	FOX		D	320-40-44.2			
			R	140-40-49.6	46.9	07.2	
	ABLE		D	157-01-49.3	40.6		
			R	[illegible]	0.9 / 39.7		
			D				
			R				

HOWARD P. KARKER INC. ENGINEERS JOB NO ____

RECORD OF HORIZONTAL DIRECTIONS

OBSERVER E.R.C. INST. NO. 1803 STATION REO

RECORDER G.H.B. DATE 11-5-51 SET NO 2

POSITION	STATIONS OBSERVED	TIME	D/R	CIRCLE READING	MEAN	DIRECTION	REMARKS
7	ABLE	11:40 PM	D	112-01-10.0	10.7 +0.2		
			R	292-01-11.4	10.9		
	BAKER		D	186-31-46.0			
			R	06-31-51.4	48.7	37.8	
	ABLE	11:45 PM	D	112-01-12.3	11.1 +0.2		
			R	292-01-10.0	10.9		
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				

JOB NO ____

HOLMES & NARVER, INC., ENGINEERS

ABSTRACT OF DIRECTIONS

STATION [illegible] COMPUTED BY [illegible] DATE 11-5-51
OBSERVER [illegible] CHECKED BY [illegible] INIT. 17803

POSITION	STATIONS OBSERVED		
	ABLE	BAKER	[illegible]
	INITIAL		
	[illegible]	14°30'	163°30'
1	[illegible]	30.[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]
4	[illegible]	42.[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	[illegible]
9	[illegible]		
10	[illegible]		
11	[illegible]		
12	[illegible]		
13	[illegible]		
14	[illegible]		
15	[illegible]		
16	[illegible]		
		[illegible]	
	[illegible]	[illegible]	[illegible]
		[illegible]	
	MEAN	[illegible]	[illegible]
CORRECTION			
		[illegible]	[illegible]
DIRECTION		[illegible]	[illegible]

COORDINATE SOLUTION OF THE THREE-POINT PROBLEM

The following solution of the three-point problem is due to Mr. K. O. Pyrd, formerly Chief of the Mapping Section, Division of Surveys, of the Tennessee Valley Authority, Chattanooga, Tennessee.

In the figure are shown the three points whose known coordinates, indicated by the subscripts, and the point whose plane coordinates, X, Y, are to be determined. The first step is to shift the origin of coordinates to the point X_3, Y_3, obtaining:

$$X_3' = Y_3' = 0$$

$$X_1' = X_1 - X_3$$

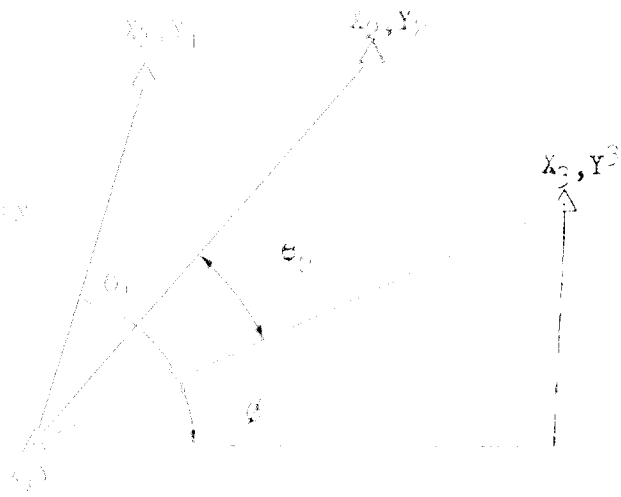
$$Y_1' = Y_1 - Y_3$$

$$X_2' = X_2 - X_3$$

$$Y_2' = Y_2 - Y_3$$

$$X' = X - X_3$$

$$Y' = Y - Y_3$$



From the figure, $\tan \phi'$ = Y' / X', and by trigonometry

$$\tan (\phi' + \theta_1) = \frac{\tan \phi' + \tan \theta_1}{1 - \tan \phi' \tan \theta_1}$$

$$\tan (\phi' + \theta_2) = \frac{\tan \phi' + \tan \theta_2}{1 - \tan \phi' \tan \theta_2}$$

or

$$\frac{Y_1' - Y'}{X_1' - X'} = \frac{\frac{Y'}{X'} + \frac{Y_1'}{X_1'}}{1 - \frac{Y'}{X'} \cdot \frac{Y_1'}{X_1'}} = \frac{X'Y_1' + X_1'Y'}{X'X_1' - Y'Y_1'}$$

and

$$\frac{Y_2' - Y'}{X_2' - X'} = \frac{\frac{Y'}{X'} + \frac{Y_2'}{X_2'}}{1 - \frac{Y'}{X'} \cdot \frac{Y_2'}{X_2'}} = \frac{X'Y_2' + X_2'Y'}{X'X_2' - Y'Y_2'}$$

where $\tan \theta_1 = m_1$ and $\tan \theta_2 = m_2$.

Clearing of fractions:

$$(Y_1' - Y')(X'X_1' - Y'Y_1') = (X_1' - X')(X'Y_1' + X_1'Y')$$

$$(Y_2' - Y')(X'X_2' - Y'Y_2') = (X_2' - X')(X'Y_2' + X_2'Y')$$

Performing the indicated multiplications:

$$X_1'Y_1'X' - m_1X_1'X'^2 - Y_1'^2Y' + m_1Y_1'X'Y' = X_1'Y_1'X' + X_1^2Y' - X'^2Y' - m_1X_1'X'Y'$$

Collecting terms and dividing the first equation by m_1, the second by m_2

$$(Y'^2 + X'^2) - X'(Y'_1 - A) - Y'(X'_1 + B) = 0 \quad \ldots\ldots\ldots\ldots\ldots (1)$$

$$(Y'^2 + X'^2) + X'(Y'_3 - C) - Y'(X'_3 + D) = 0$$

Setting the second factors of the second and third terms in the above equations equal to A, B, C and D, we have

$A = Y'_1 \cot \theta_1 - X'_1$; $B = Y'_1 \cot \theta_1$; $C = Y'_3 \cot \theta_2 - X'_3$; $D = Y'_3 + X'_3 \cot \theta_2$

Subtracting the second of the equations (1) from the first:

$$X'(A - C) - Y'(D - B) = 0$$

$$Y' = X'\frac{C - A}{D - B} = X'R \quad \text{where } R = \frac{C - A}{D - B}$$

Substituting this value of Y' into the first of the equations (1) we have

$$X'^2(R^2 + 1) + X'A - X'RB = 0 \text{ whence}$$

$$X' = \frac{BR - A}{1 + R^2}$$

And finally: $X = X' + X_1$; $Y = Y' + Y_1$

The quantity R furnishes a measure of the "strength" of the solution, the problem becoming indeterminate as R approaches the form 0/0. For example, if X'_1, Y'_1, X'_2, Y'_2 are of the order of several thousand feet, and C - A and D - B are of the order of 50 or 100 feet, the point X is close to the circle passing through the known points, and the solution is weak.

The only formal trigonometry involved in this solution is taking two cotangents from a table of natural functions. For some values of the angles, these functions might become very large, making the solution awkward. This difficulty can be avoided by so selecting the initial line as to keep these functions down to a reasonable figure generally less than 10.

R might in some cases come out very close to zero, or become practically infinite, should the point X, Y lie almost North or East of X_1, Y_1. However these difficulties seldom arise in practice. In several hundred three point solutions the writer has had to reject perhaps half a dozen fixes for weakness, and has never had to shift the initial line to get a finite value for R.

When a large number of three point determinations are to be made, it is well to solve them on a mimeographed form such as that on which the following problem is solved, which has been found highly satisfactory. The first step is to enter the coordinates of the known points in the appropriate places in the left part of the form. After the unknown coordinates have been found the coordinates X_p, Y_p are entered, and the solutions checked by inversing between X_p, Y_p and each of the known points. The difference in the azimuths of these lines should check the observed angles. Space is provided for the fourth point which should be observed whenever possible, both as a check on the fix as well as the method, and for possible use in the event that the solution based on the selected three points should prove to be weak.

The solution differs from the derivation above in that we solve first for Y instead of X. The solution can be greatly expedited by omitting those lines not marked (#) by carrying the work in the computing machine.

Reproduced from the holdings of the State Library of Victoria
Terms and Conditions Apply

STATION	DISTANCE	AZIMUTH	SECTION	LATITUDE	DEPARTURE

Since the measured angles are spherical angles, each triangle will contain more than 180°, the amount greater than 180° is termed the spherical excess and about one second for each [illegible] square miles of area of triangle. More exactly, the total spherical excess [illegible] triangle is obtained by the formula (see Special Publication No. 6, p. 7)

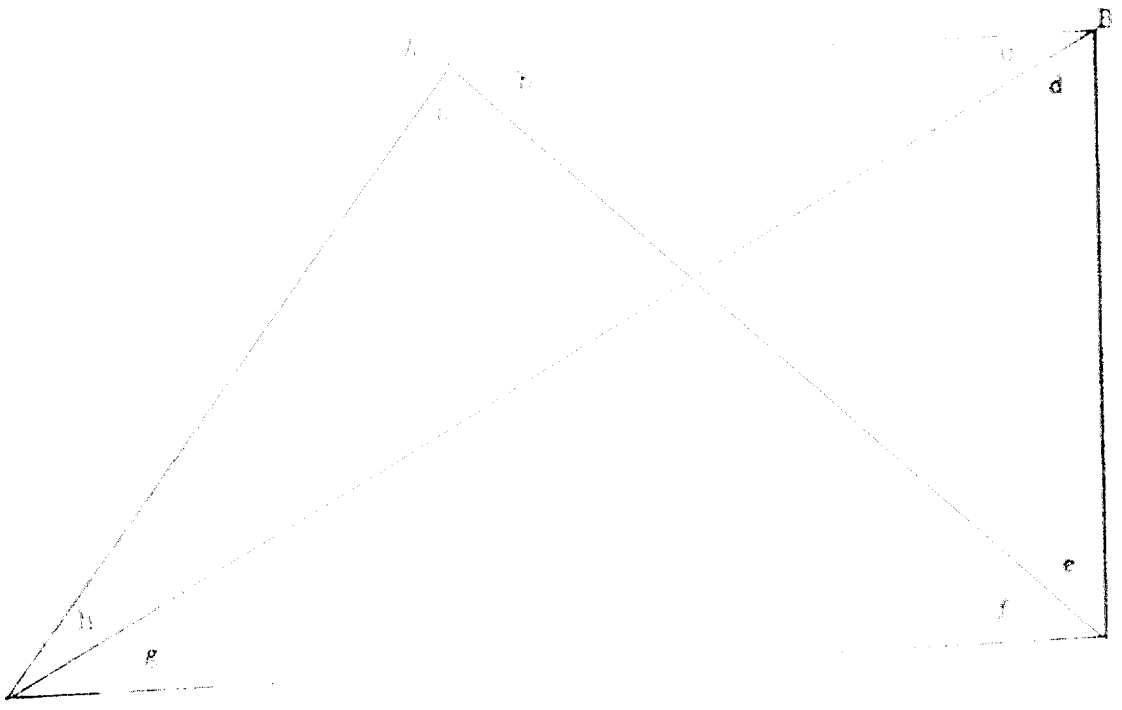
$$\epsilon = a_1 b_1 \sin C_1 \rho$$

where ϵ is the spherical excess, a_1 and b_1 are the two sides and the included angle, respectively, of the corresponding plane [illegible]. The letter letter m is used to designate that part of the expression which depends only on the latitude and the dimensions of the spheroid and the values of log m are given with the latitude as an argument in the table on page [illegible] of Special Publication No. 6.

It is clear that no correction for spherical excess will be necessary unless the triangles are very large, and then only for the most precise work. One third of the correction is [illegible] from each of the angles.

ADJUSTMENT OF A QUADRILATERAL

Before starting the adjustment of figures by [illegible] the computer should make a good clear sketch showing all the lines [illegible] which observations were made. The angles around each station of a quadrilateral are adjusted to total 360° before the figure adjustment is made. In the figure adjustment, two conditions are considered: (1) the geometric condition that the sum of the interior angles of a rectilinear figure is equal to (n - 2)180°, n being the number of sides of the figure; and (2) the trigonometric condition that in any triangle the sines of the angles are proportional to the lengths of the [illegible] opposite.



1. Geometric Conditions. When all the lines of a quadrilateral are measured, there are four overlapping triangles. These are those in triangles ABC, ACD, ABD, and BCD in the figure. In each of these triangles the sum of the three angles must be 180°. Hence from the figure,

$$b + c + h + e = 180° \quad (1)$$
$$a + f + g + h = 180° \quad (2)$$
$$a + b + c + d = 180° \quad (3)$$
$$d + e + f + g = 180° \quad (4)$$

Also the sum of the eight lettered angles in the figure must equal 360°, since they form the interior angles of a closed figure of four sides. This may be derived also by the addition of eqs. (1) and (2) or (3) and (4).

$$a + b + c + d + e + f + g + h = 360° \quad (5)$$

Further, since the opposite angles at the intersection of the diagonals must be equal, it follows that

$$b + c = f + g \quad (6)$$

$$d + e = a + h \quad (7)$$

Equation (6) is the equivalent of eq. (1) minus eq. (2) and eq. (7) is the equivalent of eq. (2) minus eq. (1).

If any three of these seven equations are satisfied, the other four must of necessity be satisfied also. Equations (5), (6), and (7) are the ones most convenient to use.

The following procedure is suggested for computation of ordinary precision:

A. Make the station adjustment as follows: Adjust the angles around each point to make their sum equal 360° by distributing the error equally (or approximately so) among the set of angles (not necessarily with non-repeating instrument).

B. Using the values resulting from the station adjustment A, add the eight angles a, b, c, d, e, f, g, and h, and subtract their sum from 360°. Divide the difference by 8, and increase slightly and the same by each of the eight angles, thus satisfying the conditions of eq. (5).

C. Using the adjusted values from B, find the difference between the sums (b + c) and (f + g) and divide this difference by four. Apply the result as a correction to each of the four angles, increasing each of the two whose sum is the smaller and decreasing each of the two whose sum is the larger, thus making these angles satisfy eq. (6) without disturbing the adjustment for eq. (5). Proceed in the same way with each of the four angles involved in eq. (7).

2. Trigonometric Conditions. If the length of one line, as BC, is known, and the length of the line AB is to be computed, the computer may select one or another series of triangles for use in accomplishing this result. For example, a solution of triangle ABC gives the length of AC, then from triangle ACE the required length of AE is found, and in the triangle AEF the length AF is found, then in ABF the length AB is computed. There are four possible chains

16

of route through the figure. It now remains to be seen whether the angle , or so far adjusted , can be altered to make the value of the length of a computed side independent of the route used. Assume that the length of AB is known and the length of AB is to be found.

$$\text{(illegible)} \tag{8}$$

Similarly,

$$\text{(illegible)} \tag{9}$$

Equating these two values of AB,

$$\text{(illegible)} \tag{10}$$

or

$$\text{(illegible)} \tag{11}$$

Expressed in logarithmic form, this is

$$\text{(illegible)} \tag{12}$$

The angles are varied by small amounts, as by applying $\pm 0.1''$, to approximate what the two groups are looking for and by finding the difference between the two sums.

Various adjustments by which this difference may be reduced to zero are possible. The least squares solution gives the most probable values to the adjusted angles, but it is unwieldy and more than is necessary for most surveys. A simple approximate method which gives a good correction for each angle and does not disturb the general condition is as follows (see adjustment of the following example):

(a) Record the log sines as shown in the example.

(b) For each angle, record the tabular logarithmic sine difference for 1" and write each in parentheses.

(c) Find the average algebraic change (d) in log sine by dividing the difference between the sums by 20.

(d) Find the average difference (e) for 1".

(e) For each angle, by proportion, find the number of seconds of correction to be applied as a correction to each angle.

(c) Add this correction to each of the observed log sines of the angles, and subtract it from each of the observed log sines of the angles, and find the corrected values thus obtained.

If one or more of the angles be greater than 90°, adjustment is to be made as just described, with the exception that the corrections are to be applied to the sine of an obtuse angle instead of the angle itself. However, since the sine of an obtuse angle decreases as the angle increases, the corresponding log sines will be changed in the direction opposite to that indicated. Usually the error introduced by that condition will be negligible for this approximate adjustment; if not, adjustment should be made as follows:

Example: Given the angles as measured in the quadrilateral (see figure), for which the station adjustment (each angle 1") has been made (see second column of following table), find the adjusted angles for both the geometric and the trigonometric conditions.

Angle	Station adjustment	Figure adjustment		
		Geometric condition		Trigonometric condition
	Adjustment a	Adjustment b	Adjustment c	Adjustment d
a	94-05-59.3	59.7	0.4	58.8
b	48-03-01.4	01.0	01.6	01.3
c	20-47-32.0	32.3	33.0	34.2
d	67-43-51.2	51.5	52.1	50.7
e	50-08-49.0	49.2	49.4	50.7
f	43-04-01.4	01.7	02.1	01.8
g	87-06-13.7	14.0	14.4	15.7
h	49-01-44.9	45.2	45.0	43.7
Sum	540-00-57.5	360-00-00.0	360-00-00.0	360-00-00.0

Adjustment a. The sum of the angles is 3" too large, resulting from the station adjustment, and is found to differ from 360° by the amount of 2.5". This amount divided by the number of angles gives the amount to be applied (0.3" + 1") to be added to each angle as shown in the 2nd column in the table.

Adjustment 2 [illegible]

Dividing this difference by 8, the correction to each angle is found to be 1.5", to be subtracted from the angles in column 3 and added to the angles in column 4. In like manner, the correction to the sides is found to be 0.2", which is added to sides [illegible] and subtracted from [illegible]. These computations are carried out only to the nearest 0.1". The results are shown in the fourth column of the table.

Adjustment 3. In order to fulfill condition (3), the logarithmic sines of the angles as given by adjustment 2 are to be [illegible] in equation (32) are recorded as shown in the following tabulations, and the tabular difference for 1" is recorded for each angle.

		Difference for 1"
log sin 1	9.9293872	3.0
log sin 2	9.9600103	55.6
log sin 4	9.8870993	17.6
log sin 5	9.4434966	80.5
	9.2199934	
log sin 3	9.9216033	18.9
log sin 6	9.2464763	33.9
log sin 7	9.6538419	22.9
log sin 8	9.4418477	68.9
	9.2657732	
	9.2199934	457.7
	0.0457798	29.7
	7.8	

The difference between the two sums is 68 units of the seven places of logarithms used. This value, divided by 8, gives the average required change in log sine, 7.8 [illegible]. The average tabular difference for 1" is 29.7 [illegible].

Hence $\frac{d}{s} = \frac{1.5}{29.7}$ [illegible], which is the average correction to be applied to each angle. Obviously, it will be added to angles 3, 6, 7, and 8, and subtracted from angles 1, 2, 4, and 5.

Since this adjustment is applied with opposite signs to alternate angles, it does not disturb the preceding condition. The final adjustment is given in the fifth column of the foregoing table.

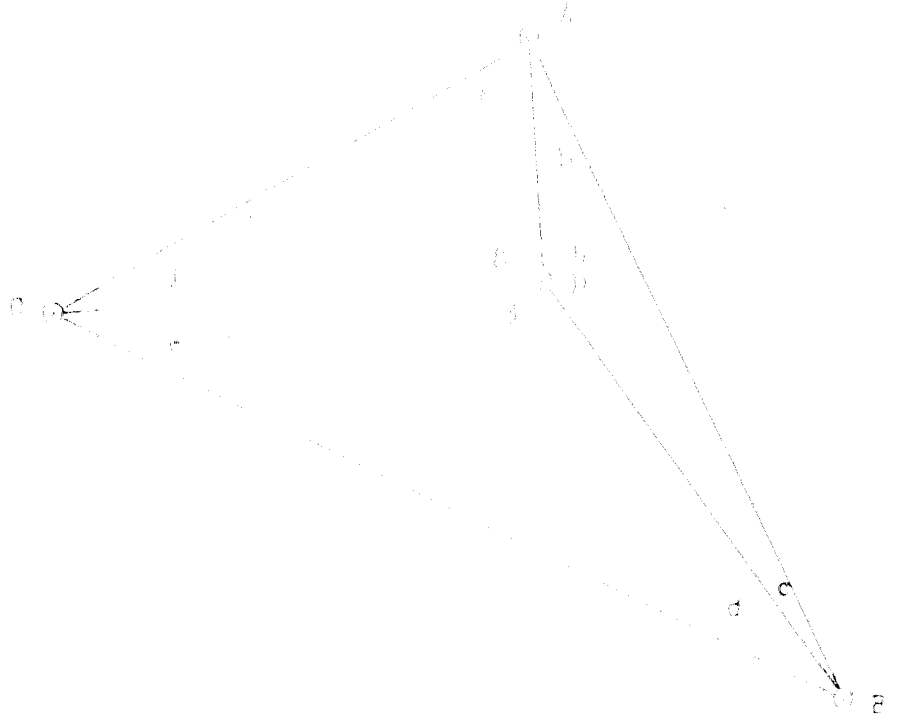
If the triangulation system consists of a chain of quadrilaterals, each quadrilateral is adjusted in the manner just described. The computation for [illegible] of the central line, and then carries through the chain from the base line

COMPUTATION OF TRIANGLES

COMPUTED BY [illegible] AREA [illegible] CHECKED BY [illegible] DATE 12-29-51

STATION		OBSERVED ANGLE	SPHERICAL EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
2-3				7494.68	3.8747533
1	A	[illegible]		03.3	0.1285794
2	B	[illegible]		06.0	9.9951673
3	C	[illegible]		50.7	9.8872857
1-3				9965.52	3.9985000
1-2				7773.53	3.8906184
2-3					3.9985000
1	D	44 - 29 - 58.6		59.4	0.1543395
2	A	91 - 05 - 58.[illegible]		58.8	0.9988873
3	C	[illegible]		01.8	9.8204106
1-3				1418164	4.1517268
1-2				9402.64	3.9732501
2-3				7494.68	3.8747533
1	D	27 - 26 - [illegible]		15.7	0.3365028
2	B	[illegible]		51.8	9.9404703
3	C	[illegible]		52.5	0.9997658
1-3				14181.64	4.1517264
1-2				16256.31	4.2110219
2-3					4.2110219
1	A	[illegible]		02.1	0.2121229
2	B	[illegible]		14.2	9.5501052
3	C	[illegible]		43.7	9.4674730
1-3				9402.64	3.9732500
1-2				7773.53	3.8906178

As in the case of the quadrilateral, the angles around each station of a central point figure are adjusted to total 360° before the figure adjustment is made. In the figure adjustment of the quadrilateral, two conditions are considered: (1) the geometric condition, and (2) the trigonometric condition.



1. Geometric Condition. It must be true of a central point figure the sum of the three angles will be 180°. Refer to the figure,

$$a + 1 + c = 180° \quad (1)$$
$$b + 2 + d = 180° \quad (2)$$
$$e + 3 + f = 180° \quad (3)$$

Also the sum of the (n-2) (in this case 4) angles forming the closed figure must total (n-2)180° where n is the number of sides of the figure (in this case 180°)

$$1 + b + 2 + e + 3 + c + d + f = 360° \quad (4)$$

Also the sum of the angles around the central point must equal 360°.

$$a + b + c = 360° \quad (5)$$

The following procedure is suggested for computation of moderate precision:

A. Make the station adjustment as follows: Adjust the angles about each point to make their sum equal 360° by distributing the error equally (or approximately so) to all of the observed angles.

B. Using the values resulting from the station adjustment A, add the three angles of each triangle and subtract 180° to find the [illegible]. Distribute the difference among the three angles (not by thirds but 180°, keeping in mind that the sum of the angles around the central point must remain 360°. This will necessitate correcting the angles at the central point by an unequal amount from those forming the other figures. This satisfies Eqs. (1), (2), (3) and (5). Eq. (4) is satisfied later [illegible].

2. Trigonometric adjustment. There are two possible choices of route through the figure. It is desirable to see whether the angles, as so far adjusted, are sufficient to make the values of the length of a computed side independent of the route used. In deriving, as is done in the quadrilateral adjustment, place the following equation:

$$\frac{\sin \quad \sin \quad \sin}{\sin \quad \sin \quad \sin} = 1 \qquad (6)$$

The angles are tested for sensibility of this equation by taking the logarithmic sines, as in the procedure for adjustment of a quadrilateral. The approximate method by computing each angle equally [illegible] suggested for the quadrilateral may be used for the central point figure.

Example: Given the angles as observed in the central point figure (see fig.) for which the station adjustment (adjustment A) has been made (see second column of following table). Find the adjusted angles for both the geometric and the trigonometric conditions.

Angle	Station Adjusted	Figure Adjusted	
		Geometric Condition	Trigonometric Condition
	Adjustment A	Adjustment B	Adjustment C
a	44° - 02' - 32.07	45° - 04' - 32.07	45° - 02' - 32.07
b	21° - 00' - 45.29	21° - 00' - 45.29	21° - 00' - 45.29
c	04° - 16' - 31.56	04° - 16' - 45.64	04° - 16' - 14.83
d	28° - 32' - 04.36	28° - 32' - 04.36	28° - 32' - 04.29
e	30° - 28' - 30.00	30° - 28' - 30.07	30° - 28' - 30.43
f	25° - 37' - 53.72	25° - 37' - 53.65	25° - 37' - 53.12
Sum	180° - 00' - 00.00	180° - 00' - 00.00	180° - 00' - 00.00
g	89° - 17' - 34.00	89° - 17' - 34.00	
h	148° - 45' - 00.00	148° - 45' - 00.00	
i	122° - 58' - 26.00	122° - 58' - 26.00	
Sum	360° - 00' - 00.00	360° - 00' - 00.00	

Adjustment B. Geometric condition: The sum of the angles in each of the three triangles are:

$$\text{(1)} \quad a + b + c + d + e + f = 180° - 00' - 00.00$$
$$\text{(2)} \quad g + h + i = 180° - 00' - 00.00$$
$$\text{(3)} \quad a + b + c + g + h + i = 180° - 00' - 00.00$$

In triangle ABD the sum of angles a and b was 180° by +0.04", 12 an equal correction was applied to each angle, the correction would be -0.02". Similarly, in triangle BDC and DBA the angle correction would be +0.33" and -0.16", applying this last correction to angles a and b, they is found to differ from 360° by 0.29". By doing this the correction to angle a b and i by 0.10" and found that the correction to angle c by 0.05" is satisfied. The remaining discrepancy of 0.02" is distributed equally between the other ten angles of each triangle, thus satisfying eqs. (1), (2) and (3).

Adjustment of Trigonometric Conditions. The logarithmic sines of the angles as given by [illegible] are tabulated below, and the tabular differences for 1" are recorded for each angle.

		Difference for 1"
Log sin a	9.8575435	9.8
Log sin c	9.2077994	13.0
Log sin e	9.7851490	9.2
	9.8504919	
Log sin b	9.9647766	4.6
Log sin d	9.8709439	9.1
Log sin f	9.6360662	4.4
	9.8239867	17.7
	9.8504919	
	-54	

The difference between the two sums is 54 units of the seven places of logarithms used. The latter, divided by 17.7, gives the average required change in log sine, 3.0 units. The average tabular difference for 1" is 52.0 = β. Hence

$$\frac{\alpha}{\beta} = \frac{9.0}{52.0} = 0.17 \text{ (nearly)},$$

which is the average correction to be applied to each angle. Obviously, it will be added to angles b, d, f, and subtracted from angles a, c, e.

Since this adjustment is applied both to the sines of alternate angles, it does not disturb the trigonometric conditions. The final adjustment is given in the fourth column of the foregoing table.

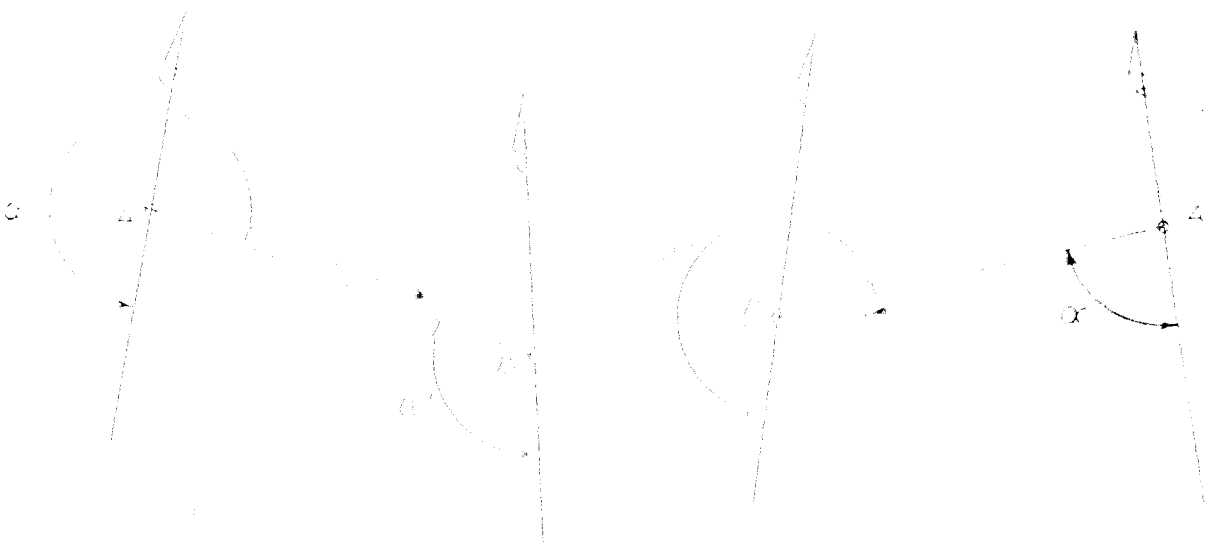


Fig. 1 Fig. 2

Notes: All west longitudes are taken as plus.

1. Find the difference of longitude (Δλ) between the two places by subtracting the smaller longitude from the larger.

2. If Δλ is greater than 180°, subtract it from 360° to obtain the smaller angle between the two meridians.

3. Find the difference of latitude (Δφ) between the two places by subtracting the smaller latitude from the larger.

4. Enter Table 1 with Δλ and Δφ to obtain the bearing and distance.

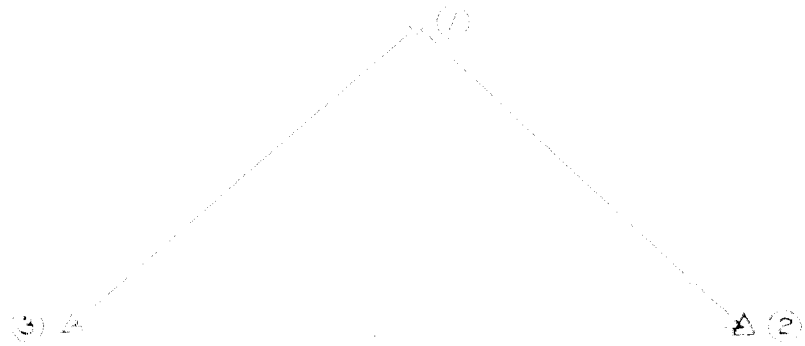
Notes: All west longitudes are taken as plus.

1. Find the algebraic difference of latitude (Δφ) by subtracting the smaller latitude from the larger.

2. If Δλ is greater than 180°, subtract it from 360° to obtain the smaller angle between the two meridians.

3. Find the mean latitude (φm) between the two places by adding the latitudes and dividing by 2.

4. Enter Table 1 with Δλ and φm to obtain the bearing and distance.



HOLMES & NARVER, INC
ENGINEERS-CONSTRUCTORS

POSITION COMPUTATION SECOND ORDER TRIANGULATION

COMPUTED BY _____ DATE _____ B. NO. _____

(1)	216	27	56.7					
(1)	40	59	20.2					
(1)	263	27	16.9					
(6)		404	29.3					
		53	32	46.2				
			90	39	03.5			
				92	23	17.698	38	20 29.159
		39.130	(4)	(5)		07 14.968		-05 06.741
					92	16 02.730	38	15 22.315

38 - 15 - 02.8 (6)

						3.7925695	
						9.9832015	(2)
5.5109843						8.5109771	
1.5949888	-39.3540	(3)	4.0271423			2.4867481	1st term
8.05428			9.9971600	(2)		7.98514	
9.99432			8.5091624	(5)		8.87183	
1.30133			0.1049921			1.30282	
9.34993	+0.2238	(3)	2.6384568	-434.9675	(5)	8.15979	2d term
3.1899			9.7917641			4.9735	
2.3801			2.4302209	-269.29	(6)	2.3804	
5.5700	0	(3)				7.3539	3d term
	-39.1302	(4)					

			3.7925695	
+306.7244	(3)		9.4359133	(2)
			8.5091624	(5)
			0.1049921	(5)
			2.0426373	-110.3157
+0.0144	(3)		9.7922254	
			1.8348627	- 68.37 (6)
+0.0023	(3)			
+306.7409	(4)			

23 MARCH 1956

CONDITION OF TRIANGLES

Computation of the four triangles of an observed quadrangle is a required part of the field work to insure that it may be considered that the observed angles are within tolerances set up by the specifications. This is the first check on the accuracy of the observations to see that closures can be within prescribed limits and that meet the requirements of the next check.

In the quadrangle shown by the sketch the line MAX-CHARLIE is the base or known line. The expansion of the net is from the line ABLE-DOG as determined from this quadrangle. Two of the computations for the quadrangle are shown on the form which sets up the computation by precise logarithms.

The b_1 or strongest pair of triangles from which the line ABLE-DOG can be determined are entered first on the form in sections A and B, followed by the second best pair in sections C and D.

The individual triangles are always computed in a clockwise direction with (1) at the new station and (2) and (3) at the stations on the known line. The line 2-3 is always the known line.

Computations are completed to the following order with figures rounded off to the closest hundredth for first order and to the closest tenth for second order triangulation.

(a) Enter the names of the stations and the observed angles in columns 1 and 2 corresponding with the letters as printed on the individual triangles.

(b) The closing error of each triangle is distributed equally, or nearly so, between the three angles and entered in column 3 as plus angles which are determined by this operation to the nearest 0".1 that cancel total 180°. It should be noted that this distribution of the closing error of the individual triangles does not satisfy the normal laws of a quadrilateral adjustment but is of the best use in angle of a distribution may differ slightly from the normal angle size, this method is satisfactory for the size of and final balancing of the angles are accomplished by the side equation adjustment or in more precise computations by the method of least squares.

(d) To complete the first triangle (A) proceed logarithmically as follows, enter the logarithm of the base side (log, the middle) of the log sine of 1 and the log sines of 2 and 3 given in columns 5 and 6. The sum of the logarithms 2-3,1 and 2. Line 1-2 is the sum of the logarithms 3-1,2 and 3. From the logarithms of 1-2 and 1-3 determine the lengths of sides and enter in column 8. Complete the computation of triangles (B), (C) and (D) in a like manner.

(e) The spherical excess is computed from the formula $e = \sin 1'' \times A$ where a, b, and C are the two sides and included angle of the corresponding triangle. Three decimal places are sufficient in computing this quantity.

Obtain log A corresponding to the area in terms of the quadrangle from S.P.no.8 page 16. To log A add the log sides of the triangle from columns 8-3, 2 and 1-3 taken from column 7. The sum is the logarithm of the spherical excess which is to be entered in column 9 on the closing line over a equality, or nearly so, between the three angles. The excess divided by three gives the plane angles to be applied and entered in column 4.

Example — Triangle B

log A	1.402
log 3-1	3.306
log 3	9.820
log sum	4.128
log e	0.277 = 0.2"

The excess of 0.2" is distributed 0.1" each to two of the angles.

(e) The total correction to the observed angle is the difference between it and the spherical angle (column 4). The correction is plus or minus depending on whether the spherical angle is larger or smaller than the observed angle.

SIDE CHECKS. In the computation of a non-closed quadrangle there are always three lines which have two determinations of their length. One of the requirements of first order triangulation is that the difference between the two values for the logarithm of the length of a line be not greater than two times the log sine difference for one second of the smallest distance angle involved in the computation of either value. If less than this value is the allowance for second order triangulation.

Referring to the following completed form, the computation from

Line A, 1-3 — log sine 1" [illegible]
" B, 1-3 — log sine 1" [illegible]
Actual diff. — Allowance [illegible]

Line B, 1-3 — log sine 1" [illegible]
" C, 1-3 — log sine 1" [illegible]
Actual diff. — Allowance [illegible]

Line B, 1-3 — log sine 1" [illegible]
" D, 1-3 — log sine 1" [illegible]
Actual diff. — Allowance [illegible]

If this computation does not satisfy the conditions of the side check reobserving of one or more sections will be necessary. The most probable angles if required may generally be determined by inspection of the computations or by applying a little care on first check. When these conditions have been satisfied the quadrangle may be considered as meeting the requirements and no further check will be required at this time.

(C)

23 MARCH 1956

COMPUTATION OF TRIANGLES

COMPUTED BY _____ DATE 3-7-56

STATION	OBSERVED ANGLE	CORR'N	CORRECTED ANGLE	LOG SIN	LOG DIST	PLANE ANGLE AND DISTANCE	LOGARITHM
2-3							
1 ABIE						7494.98	3.8747533
2 NAN						05.0	0.1285782
3 CHARLIE						05.0	9.9951673
1-3						60.0	9.9572850
1-2						9986.49	3.9984998
						7973.80	3.9700165
2-3							3.9984998
1 DOG						55.0	0.1543401
2 ABIE						99.0	9.9980873
3 CHARLIE						05.0	9.8204708
1-3						19181.08	4.1517262
1-2						9401.04	3.9732497
2-3							3.9747833
1 DOG						15.0	0.0368036
2 NAN						05.0	9.9404709
3 CHARLIE						05.0	9.[illegible]
1-3						19181.08	4.1517727
1-2						19888.04	4.2981826
2-3							4.2981826
1 ABIE						05.0	0.[illegible]
2 NAN						14.0	9.[illegible]
3 DOG						45.0	9.[illegible]
1-3						9401.04	3.[illegible]
1-2						9772.80	3.[illegible]

(1) (2) (3) (4) (5) (6) (7)

HOLMES & NARVER, INC.

ENGINEERS - CONSTRUCTORS

SURVEY DEPARTMENT

DESCRIPTION & RECOVERY

of

TRIANGULATION STATIONS

[illegible] 7 (2 / [illegible] section)

For establishment of a new station, two [illegible] preferably three reference marks would also be established. The [illegible] should be a 3/8" dia. brass, or other non-ferrous bolt marker, [illegible] as a bench mark. The station mark should be stamped with the name of the station, U.S.C.&G.S. and the year it is established. The reference point should be punch marked at near the center of the marker as possible. The station should be set in concrete in such a way that it cannot be easily disturbed. Local conditions should govern this however, the ideal monument would be a 12" x 12" reversed pyramid set in the coral reef underlying the island soil. The reference mark should be a non-ferrous metal with a surface large enough to stamp the following words: Bolt, [illegible] (2 or 3 min.) - the station name, U.S.C.&G.S. and the date of [illegible]. A 3/8" [illegible] brass marker is most desirable, but a large [illegible] bolt head here on ship would be also acceptable. This marker should be set in a concrete mound [illegible] so that the top of the station mark, or punch [illegible] mark. Should a road end back in either a concrete slab or the top of a [illegible] mound, a 3/8" [illegible] (such as a brass escutcheon pin) should be used and the head ground down to a point enough to stamp the required data on it.

When the station and its reference marks have been established, a complete description should be prepared containing the following items, viz:

(1) A physical description of the station area and the USC&GS building which type of marker was used, how it is marked, and how it is set (concrete, bolted into a ship, etc.).

(2) A sketch of the station location on the island to establish its [illegible] tide line, trees, and outstanding buildings or structures.

(3) A description of the route to the station from one of the reference marks from an [illegible] existing monument (preferably the control point station (Coral or Reference mark, Coast and [illegible]) or a prominent landmark whose coordinate location is known.

(4) The horizontal distance from the station mark to each of the reference marks and the azimuths between the reference marks.

(5) The elevations of the station mark and the reference marks. If no bench mark available to obtain the elevations, an elevation should be obtained from vertical observations and used for that purpose. If no bench mark exists, one will have to be used.

(6) A brief description of the instruments, equipment and methods used in making the measurements in paragraphs 3, 4 and 5.

Where at all practical the station mark should be witnessed with a triangular wooden barricade and the reference marks by a painted X on a post or tree near and away from the station mark.

RECOVERY OF AN EXISTING CONTROL

The purpose of station recovery is to determine correctly the suitability of an existing triangulation station control point for horizontal and vertical location already available without additional field work and to provide a check on any possible future loss or change in the station which would render it useless without further field work.

All previous recovery notes for station described should be made available to the person making the recovery to insure a full and complete recovery of the station.

When the station has been found with the mark or its corresponding to the data required in the preceding section, the following should be obtained. This data should be obtained by as near the same method and using as near the same methods and equipment as was used in the latest station description or survey. These values should be recorded on a Horizontal Control, Triangulation, Station form which is very similar to the "Description of Triangulation Station" form. Any differences in measured values from previous values should be checked and, if found to be actual changes, should be noted. Any changes in the features of the location which might cause trouble in recovering the station should be noted.

the recovery note and a sketch of the location plotted in context to the sketch required for the Station Description should also be added to the recovery.

In the event a station or reference mark has been disturbed or damaged in any way, no attempt to correct this should be made by the initial recovery pleader. Instructions for correcting, changing, supplementing, etc. will be issued by the Survey Office after examination of the initial recovery note from the field. When instructions or changes, supplements, etc. are issued, they will be issued in conformity with N. O. No. 5, Paragraphs as published in S. P. #247, modified to fit details accordingly.

FIELD BOOKS

Survey Generally

1. A record must be made of all field survey work in a duplicating Field Book. There are no exceptions. On projects, such as, plane table work, in which the actual work performed is not entered in the Field Book, a Field Book entry must be prepared as outlined in Paragraphs 9 and 11. The data not recorded in a Field Book must show the same information as the Field Book entry.

2. Two Field Books will be carried by each Party Chief. One book will be used for all Domestic (non-scientific) work, the other for Scientific work.

3. In Scientific work, Stations are referred to by number (i.e. not as shot tower, detector, etc.).

4. In Domestic work, all Buildings are referred to by number (i.e. not as mess-hall, water tower, etc.).

5. In both Domestic and Scientific work it is extremely important to show elevations of structures. Unless specifically directed otherwise, this should be in relation to the site datum. The notes must include all the details of the work.

6. Angles turned must show actual details, such as, initial, double or six, and mean. Generally, no pre-planned angles will be shown. Should it be desirable to show pre-planned angles, they should be clearly labeled as such.

7. Distances measured must show actual details, such as, forward and back measurements, eccentricity, such as, stadia, tying, balance, etc.

8. Sketches are used to clarify the work performed. When deciding whether one is necessary, remember that the notes will be processed and used by others not as familiar with the circumstances as you may be. Label all points shown and use a north arrow.

9. The first line of the left hand page must show the specific location and type of work. Examples: Building 20A, Reference Layout; Station 120, W.P. location; Warehouse Area, Topography; Bench 100, Levels. On the second line show the site by its current code name, such as, Site Elmer. For work located near a site name (Building, Reef, etc.), such as, "The Elmer Reef; Sites Elmer-Fred Line".

10. When continuous pages in the same Field Book are used, it is not necessary to repeat the title between the halves of the first right hand page used must show "continued on page _____". On following pages, each one must show "continued from page _____" at the top and "continued on page _____" at the bottom of the right hand page. The bottom of the last page used shall show "End of survey". If the right hand pages used are not in sequence in the Field Book or are in different books, the title shall appear on each page.

11. The first line on the right half of the right hand page is used for the date and general [illegible] succeeding lines for the names of the party, state of the weather and the time of starting and stopping work.

12. An index shall be kept on the first page of the Field Book, in the following manner:

PAGE	DESCRIPTION	SITE
[illegible]	Station 340, N. E. Cor. Tract	Ruby
[illegible]	Station 302, Angle	Ruby

13. Field Book originals must be turned promptly in the Survey Office.

14. ALL FIELD NOTES ARE TO BE MADE IN INK. THERE ARE NO EXCEPTIONS.

M. F. Curran jr
16 August 1956

FIELD NOTE [illegible]

Field Note original pages (white sheets) are indexed immediately after arriving at the office. They are then thoroughly checked for accuracy and completeness. If the checker finds them unsatisfactory, he returns them to the Chief of Party with a note attached stating the details in question.

When the Field Note originals have been checked and found satisfactory, the checker turns them over to the Department Head. The latter assigns them to a computer or draftsman for necessary action, such as, preparing tabulations, drawings, etc. After all necessary action has been taken, the Field Note originals are filed in the binder labeled with the Field Book number corresponding to that of the Field Notes. At this time a note is made on the Field Note pages in red pencil stating what action was taken.

If no one is available to take the necessary action, the Department Head makes an entry in a pending file. This file is reviewed daily.

When the Chief of Party has used all of the pages in a Field Book from 2 to 30 inclusive, he turns in the Field Book Index kept on Page 1. The Field Book originals are checked and the Chief of Party called to account for any missing pages.

The Index of Field Books consists of 3 x 5 inch cards kept in a standard metal file box. A Domestic and a Scientific file is kept for each Atoll. These are subdivided as follows:

DOMESTIC

SITE

Buildings	Numerical order
Roads	Alphabetical order
Sewers	Alphabetical order
Water Lines Electrical (Underground) Electrical (Overhead)	Alphabetical order of sheets of Site Plan
Topography	Separately when not directly related to any of above subdivisions
Hydrography	Separately when not directly related to any of above subdivisions
Marine Facilities	Numerical when facility does not have a building number
Horizontal Control	Numerical order
Vertical Control	Numerical order

SCIENTIFIC

Numerical

Station numbers and titles only on large sheet cards

Files

Stations

EARTHWORK COMPUTATIONS

COMPUTED BY ____ DATE ____ JOB ____ LOCATION ____

CHECKED BY ____ DATE ____ SHEET ____ OF ____

		EXCAVATION			EMBANKMENT		
STATION	DISTANCE	AREA SQ. FT.	$\frac{1}{2}(A+A')$	CUBIC YARDS	AREA SQ. FT.	$\frac{1}{2}(A+A')$	CUBIC YARDS
TOTALS (THIS SHEET)			CUT			FILL	
TOTALS BROUGHT FORWARD							
CUMULATIVE TOTALS							

S-2?

Surl

HOLMES & NARVER, INC.
ENGINEERS - CONSTRUCTORS

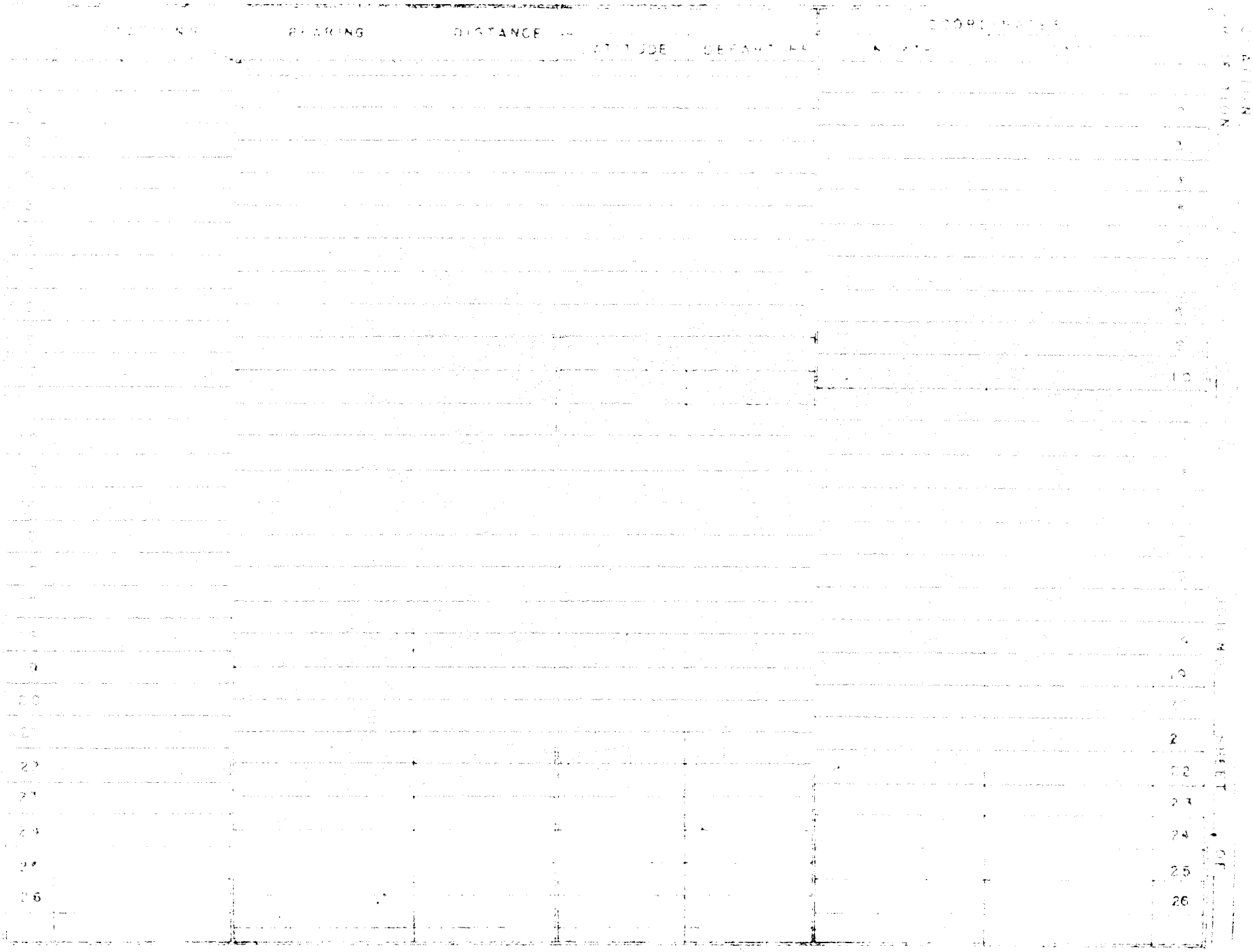
EARTHWORK COMPUTATIONS

COMPUTED BY ______ DATE ______ JOB NO. ______ LOCATION ______

CHECKED BY ______ DATE ______ SHEET ______ OF ______

STATION	DISTANCE	EXCAVATION AREA SQ. FT.	$\frac{1}{2}(A+A')$	CUBIC YARDS	EMBANKMENT AREA SQ. FT.	$\frac{1}{2}(A+A')$	CUBIC YARDS
TOTALS (THIS SHEET)			CUT			FILL	
TOTALS BROUGHT FORWARD							
CUMULATIVE TOTAL							

S-28



PLANE COORDINATES

LOCATION

PROJECTION

JOB NO

SHEET OF

COORDINATES

NORTH

EAST

DEPARTURE

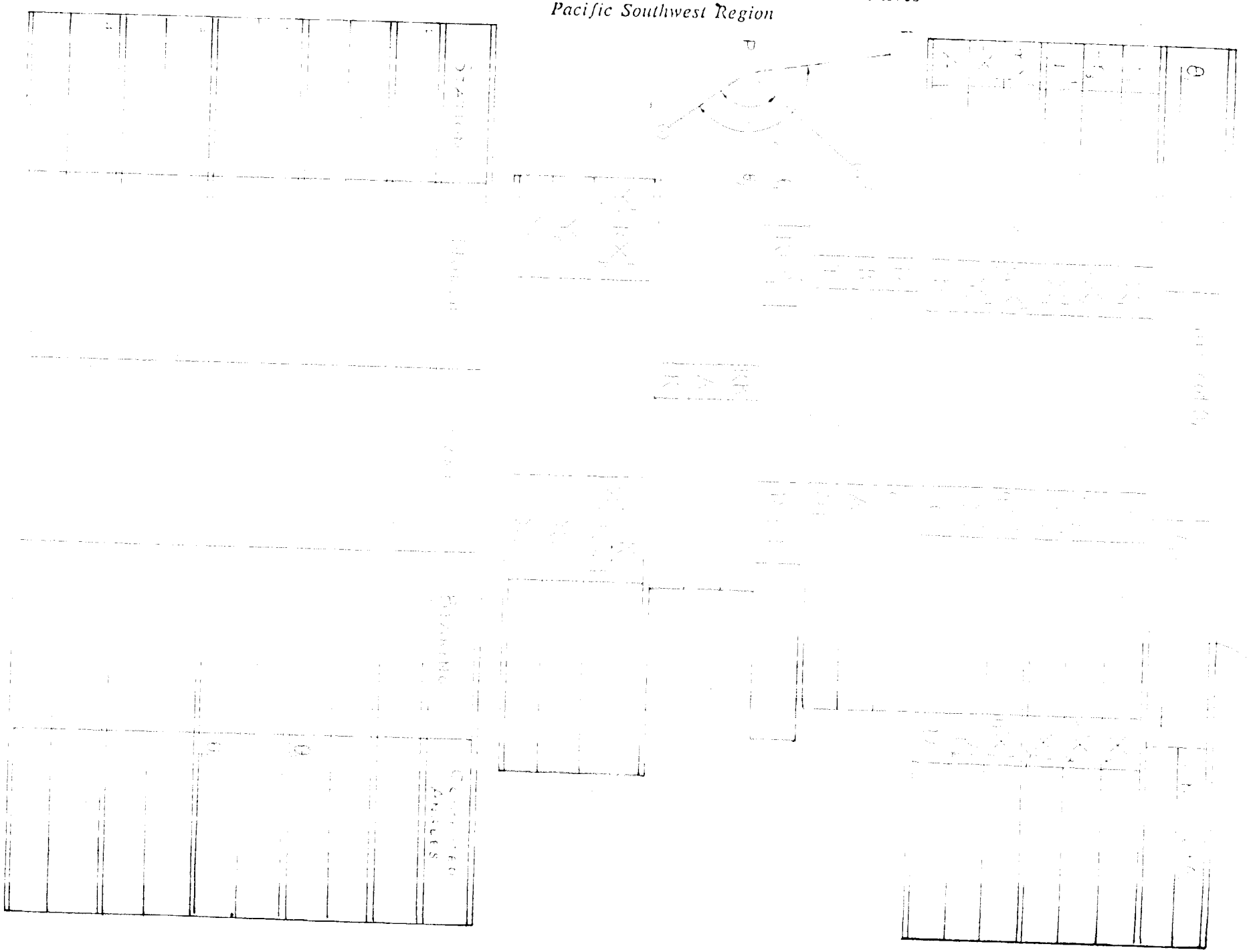
LATITUDE

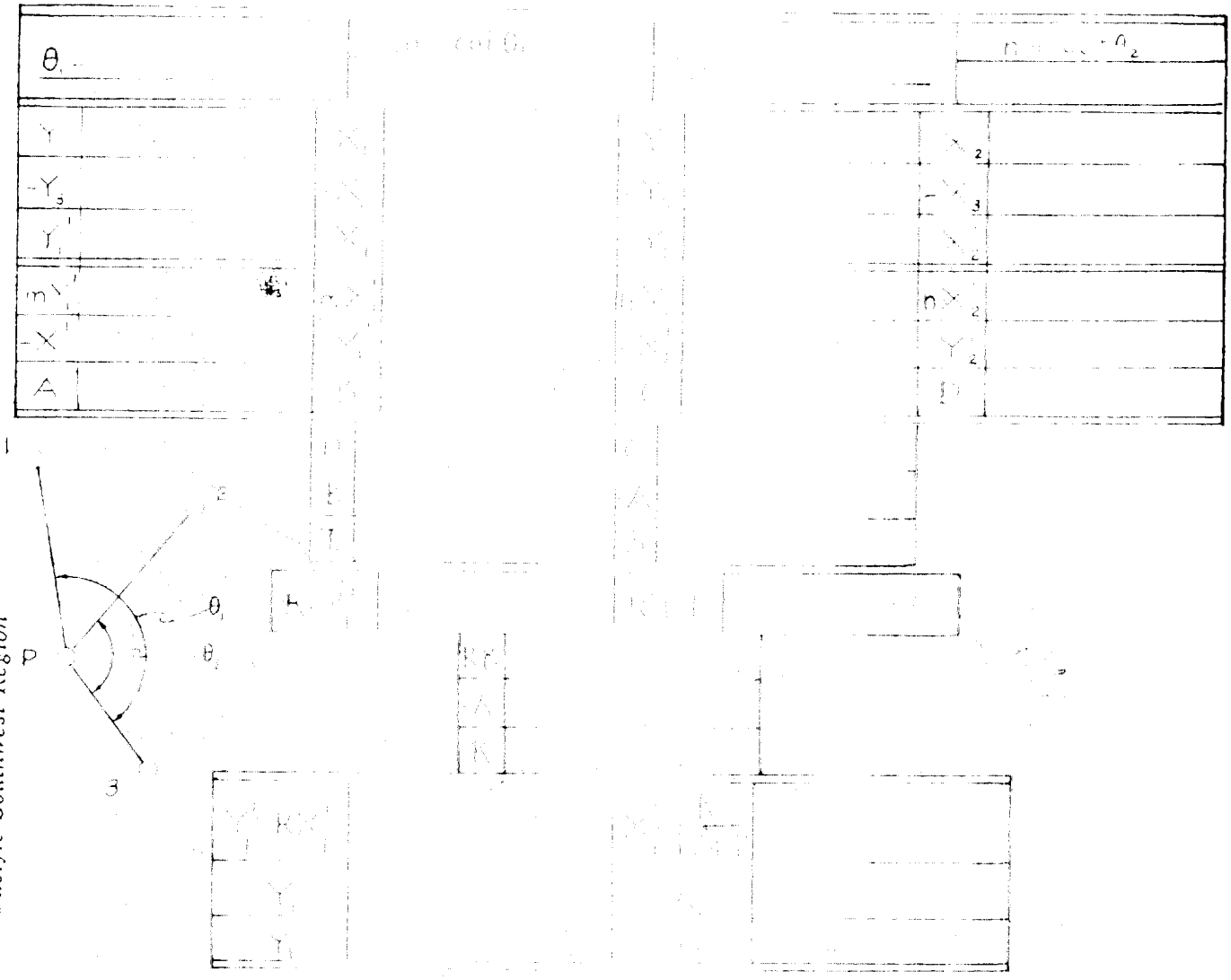
DISTANCE

BEARING

STATIONS

99





Station			Bearing	Computed Angles
P				
				θ
				θ

JOB NO _____

HOLMES & NARVER (INC.) ENGINEERS

COMPUTATION OF TRIANGLES

COMPUTED BY _____ CHECKED BY _____ DATE _____

STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANG	SPHERICAL EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
2-3						
1						
2						
3						
3						
1-2						
2-3						
1						
2						
3						
1-3						
1-2						
2-3						
1						
2						
3						
1-3						
1-2						

JOB NO. ____

HOLMES & NARVER INC. ENGINEERS

COMPUTATION OF TRIANGLES

COMPUTED BY ____ CHECKED BY ____ DATE ____

STATION	OBSERVED ANGLE	CORR-N	SPHERCL ANGLE	SPHERCL EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
2-3						
1						
2						
3						
1-3						
1-2						
2-3						
1						
2						
3						
1-3						
1-2						
2-3						
1						
2						
3						
1-3						
1-2						
2-3						
1						
2						
3						
1-3						
1-2						

HOLMES & NARVER, INCORPORATED ENGINEERS JOB No. ____

ABSTRACT OF WYE LEVELS AND COMPUTATION OF INCLINATION CORRECTIONS.

MARK	DISTANCE	MEAN OF WYE READINGS	INCLINATION CORRECTION	ELEVATION	ADJUSTED ELEVATIONS	REMARKS
	FEET	FEET	FEET	FEET	METERS	

HOLMES & NARVER INC., ENGINEERS

JOB No.

ABSTRACT OF WYE LEVELS AND COMPUTATION OF INCLINATION CORRECTIONS.

POINT	DISTANCE	MEAN DIFF. OF ELEV.	INCLINATION CORRECTION	ELEVATION	MEAN ELEVATION	REMARKS
	METERS	METERS-FEET	M.M.	METERS	METERS	

HOWE & MARSH ENGINEERS JOB NO

RECORD OF HORIZONTAL DIRECTIONS

OBSERVER INST NO STATION

RECORDER DATE SET NO

POSITION	STATIONS OBSERVED	TIME	D M S	CIRCLE READING	MEAN	DIRECTION	REMARKS

SURVEY

HOLMES & NARVER INC., ENGINEERS JOB NO.____

RECORD OF HORIZONTAL DIRECTIONS

OBSERVER_____ INST. NO._____ STATION_____

RECORDER_____ DATE_____ SET NO._____

POSITION	STATIONS OBSERVED	TIME	D/R	CIRCLE READING	MEAN	DIRECTION	REMARKS
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				
			D				
			R				

RUDOLPH & HARRIS, INC., ENGINEERS
SURVEY DEPARTMENT

DAILY REPORT

JOB NO. _____ LOCATION _____ DATE _____

WORK REQUESTS | WORK STARTED OR COMPLETED

REMARKS

SIGNED _____

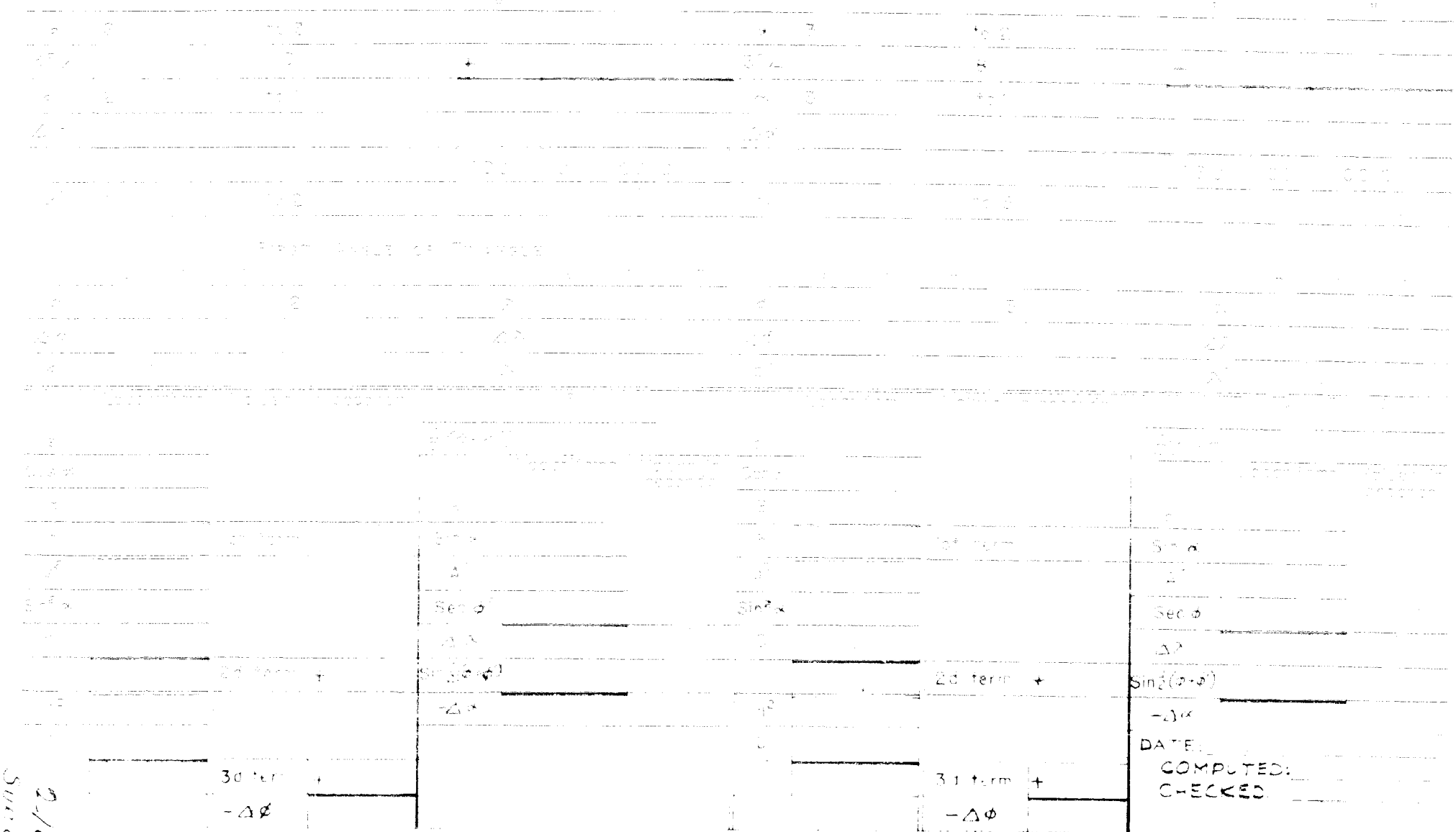
SUR 7

REMARKS	WORK REQUESTS	WORK STARTED OR COMPLETED	JOB NO.	DATE

HOLMES & NARVER INC., ENGINEERS

JOB Nº ____

POSITION COMPUTATION SECOND ORDER TRIANGULATION



HOLMES & NARVER INC., ENGINEERS

POSITION COMPUTATION SECOND ORDER TRIANG

		°	'	"
α 2	to 3			
3d ∠	8	+		
α 2	to 1			
Δα				
		180	00	00.0
	to 2			

α	3	to 2	
3d ∠		8	
α	3	to 1	
Δα			
α′	1	to 3	

FIRST ANGLE OF TRIANGLE

	°		°	'	"
φ	2	λ			
Δφ		Δλ			
φ′		λ′			

	°	'	"		°	'	"
φ				3			
Δφ							
φ′				1			

				½(φ+φ′)			
					Logarithms	Values in seconds	
B				s			
h		1st term	"	Sin α			
s²				A′			
Sin²α				Sec φ′			
C				Δλ		"	
		2d term	+	Sin ½(φ+φ′)			
h²				−Δα			
D							
		3d term	+				
		−Δφ					

		Logarithms	Values in seconds
s			
Cos α			
B			
h		1st term	"
s²			
Sin²α			
C			
		2d term	+
h²			
D			
		3d term	+
		−Δφ	

½	
Si	
S	
Δ	
Sin ½	
−Δ	
DA	
C	
C	

Sue 8 2/11

HOLMES & NARVER INC - ENGINEERS CONSTRUCTORS

COMPUTATION OF BASE LINE

CALC BY CHKD BY DATE JOB NO LOCATION

SECTION	DATE	DIR OF MEAS	TAPE NO	SUPPORT	INCORR NO	ENGTH METERS	TEMP °C	CORRECTIONS TEMP METERS	CORRECTIONS SET-BACK METERS	CORRECTIONS INCLINATION METERS	CORRECTIONS SEA LEVEL METERS	REDUCED LENGTH METERS	ADOPTED LENGTH METERS-FEET

C/B

HOLMES & NARVER INC.-ENGINEERS CONSTRUCTORS

COMPUTATION OF _____ BASE LINE

CALC BY _____ CHKD BY _____ DATE _____ JOB NO _____ LOCATION _____

SECTION	DATE	DIR OF MEAS	TAPE NO	SUP-PORT	UNCORR. LENGTH		TEMP	CORRECTIONS				REDUCED LENGTH	ADOPTED LENGTH
					NO	METERS		TEMP	SET-UP SET-BACK	INCLINATION	SEA LEVEL		
							"C"	METERS	METERS	METERS	METERS	METERS	METERS-FEET

BOLTON & BARVER — ENGINEERS — CONSTRUCTORS

RECOVERY NOTE — TRIANGULATION STATION

NAME OF STATION _____ LOCATION _____ JOB NO _____

ESTABLISHED BY _____

RECOVERED BY _____ DATE _____ FIELD BOOK NO _____

OBJECT	DISTANCE AND DIRECTION FROM REFERENCE MARKS				
	DISTANCE		DIRECTION	AZIMUTH	ELEV
	FEET	METERS			

DETAILED DESCRIPTION OF STATION

HOLMES & NARVER ENGINEERS-CONSTRUCTORS

RECOVERY NOTE TRIANGULATION STATION

NAME OF STATION_____ LOCATION_____ JOB NO._____

ESTABLISHED BY_____

RECOVERED BY_____ DATE_____ FIELD BOOK REF. _____

DISTANCES AND DIRECTIONS TO REFERENCE MARKS					
OBJECT	DISTANCE		DIRECTION	AZIMUTH	ELEV.
	FEET	METERS			

DETAILED DESCRIPTION OF STATION

HOLMES & NARVER INC. ENGINEERS · CONSTRUCTORS

GEOGRAPHIC POSITIONS

LOCATION _____ ORDER TRIANGULATION

DATUM _____ JOB NO _____ SHEET ____ OF ____

STATION	LATITUDE / LONGITUDE	AZIMUTH	BACK AZIMUTH	TO STATION	DISTANCE LOG METERS	DISTANCE METERS	DISTANCE FEET

2-16

HOLMES & NARVER INC. - ENGINEERS - CONSTRUCTORS

GEOGRAPHIC POSITIONS

LOCATION _____

DATUM _____ ORDER OF TRIANGULATION _____

JOB NO. _____ SHEET _____ OF _____

STATION	LATITUDE / LONGITUDE	AZIMUTH	BACK AZIMUTH	TO STATION	DISTANCE LOG METERS	DISTANCE METERS	DISTANCE FEET

CORRECT[illegible] FOR [illegible] CURVATURE AND REFRACTION

Height (in ft.) = Dist (in miles) x 0.678 Dist (in miles) = √Height (in ft.) x 1.32

		TENTHS								
		0.1	[illegible]	[illegible]	0.4	[illegible]	0.6	0.7	0.8	0.9
0				[illegible]	[illegible]	[illegible].1	0.2	0.3	0.4	0.5
1	0.6	0.7	[illegible]	[illegible].0	[illegible].1	[illegible].3	1.5	1.7	1.9	2.1
2	2.3	2.5	[illegible]	[illegible].0	[illegible].3	3.6	3.9	4.2	4.5	4.8
3	5.2	5.5	[illegible]	[illegible].3	6.6	[illegible].0	7.4	7.9	8.3	8.7
4	9.2	9.6	[illegible]	10.6	11.1	11.6	12.1	12.7	13.2	13.8
5	14.4	14.9	[illegible]	16.1	16.7	17.4	18.0	18.6	19.3	20.0
6	20.6	21.4	[illegible]	22.8	23.5	24.3	25.0	25.8	26.6	27.3
7	28.1	28.9	[illegible]	[illegible].6	31.4	32.3	33.2	34.0	34.9	35.8
8	36.7	37.7	[illegible]	[illegible]	[illegible]	41.5	42.5	43.4	44.5	45.5
9	46.5	47.5	[illegible]	[illegible]	[illegible]	51.8	52.9	54.0	55.1	56.3
10	57.4	58.5	[illegible]	60.9	62.1	63.3	64.5	65.7	66.9	68.2
11	69.4	70.7	[illegible]	73.3	74.6	75.9	77.2	78.6	79.9	81.3
12	82.6	84.0	[illegible]	[illegible]	88.2	[illegible]	91.1	92.6	94.0	95.5
13	97.0	98.5	[illegible]	[illegible]	[illegible]	[illegible]	106.1	107.7	109.3	110.9
14	112.5	114.1	[illegible]	[illegible]	[illegible]	[illegible]	122.3	124.0	125.7	127.4
15	129.1	130.8	[illegible]	134.3	136.1	[illegible]	139.6	141.4	143.3	145.1
16	146.9	148.7	[illegible]	152.5	[illegible]	[illegible]	158.1	160.0	162.0	163.9
17	165.8	167.8	[illegible]	[illegible]	[illegible]	[illegible]	177.8	179.8	181.8	183.9
18	185.9	188.0	[illegible]	[illegible]	[illegible]	[illegible]	198.5	200.7	202.8	205.0
19	207.2	209.3	[illegible]	[illegible]	[illegible]	[illegible]	220.4	222.7	225.0	227.2
20	229.5	231.8	[illegible]	236.5	[illegible]	[illegible]	243.5	245.9	248.3	250.7
21	[illegible]	255.5	[illegible]	[illegible]	[illegible]	[illegible]	267.7	270.2	272.7	275.2
22	277.7	280.3	[illegible]	285.4	[illegible]	[illegible]	293.1	295.7	298.3	300.9
23	303.6	306.2	[illegible]	311.5	[illegible]	[illegible]	319.6	322.3	325.0	327.8
24	330.5	333.3	[illegible]	[illegible]	[illegible]	[illegible]	347.3	350.1	352.9	355.8
25	358.6	361.5	[illegible]	[illegible]	[illegible]	[illegible]	376.1	379.0	382.0	384.9
26	387.9	390.9	[illegible]	[illegible]	[illegible]	[illegible]	406.0	409.1	412.2	415.2
27	418.3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	437.1	440.3	443.5	446.7
28	449.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	469.4	472.7	476.0	479.3
29	482.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	502.8	506.2	509.6	513.0
30	516.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	537.31	540.8	544.4	547.9
31	551.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
32	587.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
33	624.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
34	663.3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35	703.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		0.1	[illegible]	0.3	[illegible]	[illegible]	0.6	0.7	0.8	0.9

(0.5738333)

2/8 Sue 13

S-34

TEMPERATURE CORRECTION - STEEL TAPE
CALIBRATED AT 68°

		0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
66°	70	384	1153	1923	2692	3461	4230	5000	5769	6538	7307	8076	8846	9615	10384	11153	11923
64°	72	192	576	961	1346	1730	2115	2500	2884	3269	3653	4038	4423	4807	5192	5576	5961
[illegible]																	
[illegible]																	
	80				448	576	705	833	961	1089	1217	1346	1474	1602	1730	1859	1987
52°	84	44	44	240	336	432	528	626	721	817	913	[illegible]	1105	1201	1298	1394	1490
50°	86	48	128	213	299	384	470	555	641	726	811	897	982	1068	1153	1239	1324
[illegible]																	
46°	90	86	84	174	244	314	384	454	524	594	664	734	804	874	944	1013	1083
44°	92																
38°	98	4	76	128	179	230	282	333	384	435	487	538	589	641	692	743	794
36°	100	24	72	120	168	216	264	312	360	408	456	504	552	600	649	697	745
34°	102	22	67	113	158	203	248	294	339	384	429	475	520	565	610	656	701
32°	104	21	64	106	149	192	235	277	320	363	406	448	491	534	576	619	662
30°	106	20	60	101	141	182	222	263	303	344	384	425	465	506	546	587	627
28°	108	19	57	96	134	173	211	250	288	326	365	403	442	480	519	557	596
26°	110	18	54	91	128	164	201	238	274	311	347	384	421	457	494	531	567
24°	112	17	52	87	122	157	192	227	262	297	332	367	402	437	472	506	541
22°	114	16	50	83	117	150	183	217	250	284	317	351	384	418	451	484	518
20°	116	16	48	80	112	144	176	208	240	272	304	336	368	400	432	464	496
18°	118	15	46	76	107	138	169	200	230	261	292	323	353	384	415	446	476
16°	120	14	44	73	103	133	162	192	221	251	281	310	340	369	399	428	458

Sur/4

CHORD AND DEFLECTION TABLE FOR CURVES OF STANDARD RADII

DEFL. FOR 1° OF ARC = $\frac{1718.8733}{R}$

CHORD = 2R X SIN (DEFL. FOR 1 ARC LENGTH)

RADIUS	LENGTH OF ARC	DEFLECTION FOR ONE ARC LENGTH	CHORD	DEFLECTION FOR A ONE FOOT ARC
[illegible]	25	9°-32'-57.5"	24.884	22.91831'
[illegible]	"	7°-09'-43.1"	24.935	17.18873'
[illegible]	"	5°-43'-46.5"	24.958	13.75009'
[illegible]	"	4°-46'-28.7"	24.971	11.45916'
[illegible]	"	4°-05'-33.2"	24.979	9.82213'
[illegible]	"	3°-34'-51.6"	24.984	8.59437'
225	"	3°-10'-59.2"	24.987	7.63944'
250	"	2°-51'-53.2"	24.990	6.87549'
275	"	2°-36'-15.7"	24.991	6.25045'
300	"	2°-23'-14.4"	24.993	5.72958'
325	50	4°-24'-26.5"	49.951	5.28884'
350	"	4°-05'-33.2"	49.958	4.91107'
375	"	3°-49'-11.0"	49.963	4.58356'
400	"	3°-34'-51.6"	49.967	4.29718'
425	"	3°-22'-13.2"	49.971	4.04441'
450	"	3°-10'-59.2"	49.974	3.81972'
475	"	3°-00'-56.0"	49.977	3.61868'
500	"	2°-51'-53.2"	49.979	3.43775'
525	"	2°-43'-42.1"	49.981	3.27404'
550	"	2°-36'-15.7"	49.983	3.12522'
575	"	2°-29'-28.0"	49.984	2.98934'
600	"	2°-23'-14.4"	49.986	2.86479'
700	"	2°-02'-46.6"	49.989	2.45553'
800	"	1°-47'-25.8"	49.992	2.14859'
900	"	1°-35'-29.6"	49.994	1.90986'
1000	"	1°-25'-56.6"	49.995	1.71887'
1100	"	1°-18'-07.8"	49.995	1.56261'
1200	"	1°-11'-37.2"	49.996	1.43239'
1300	"	1°-06'-06.6"	49.996	1.32221'
1400	"	1°-01'-23.3"	49.997	1.22777'
1500	"	0°-57'-17.8"	49.997	1.14592'
1600	"	0°-53'-42.9"	49.998	1.07430'
1700	"	0°-50'-33.3"	49.998	1.01110'
1800	"	0°-47'-44.8"	49.998	0.95493'
1900	"	0°-45'-14.0"	49.998	0.90467'
2000	"	0°-42'-58.3"	49.998	0.85944
2250	"	0°-38'-11.8"	49.998	0.76394'
2500	"	0°-34'-22.6"	49.998	0.68755'
2750	"	0°-31'-15.1"	49.999	0.62504'
3000	"	0°-28'-38.6"	49.999	0.57296'
3250	"	0°-26'-26.6"	49.999	0.52888'
3500	"	0°-24'-33.3"	49.999	0.49111'
3750	"	0°-22'-55.1"	50.000	0.45837'
4000	"	0°-21'-29.2"	50.000	0.42972'
4250	"	0°-20'-13.3"	50.000	0.40444'
[illegible]	"	0°-19'-05.9"	50.000	0.38197'
4750	"	0°-18'-05.6"	50.000	0.36187'
5000	"	0°-17'-11.3"	50.000	0.34377'
5500	"	0°-15'-37.6"	50.000	0.31252'
[illegible]	"	0°-14'-19.4"	50.000	0.28648'

220

Sue 15

TEMPERATURE CORRECTION - STEEL TAPE
CALIBRATED AT 84°

	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
82° 86	384	1153	1923	2692	3461	4230	5000	5769	6538	7307	8076	8846	9615	10384	11153	11923
80° 88	132	576	961	1346	1730	2115	2500	2884	3269	3653	4038	4423	4807	5192	5576	5961
78° 90	128	384	641	897	1153	1410	1666	1923	2179	2436	2692	2948	3205	3461	3717	3974
76° 92	[illegible]	288	480	673	865	1057	1250	1442	1634	1826	2019	2211	2403	2596	2788	2980
74° 94	[illegible]	[illegible]	384	538	[illegible]	846	1000	1153	1307	1461	1615	1769	1923	2076	2230	2384
72° 96	[illegible]	[illegible]	320	448	576	705	833	961	1089	1217	1346	1474	1602	1730	1858	1987
70° 98	64	84	74	384	494	604	714	824	934	1043	1153	1263	1373	1483	1593	1703
68° 100	[illegible]	144	240	336	432	528	625	721	817	913	[illegible]	1105	1201	1298	1394	1490
66° 102	[illegible]	[illegible]	213	299	384	470	555	641	726	811	897	982	1068	1153	1239	1324
64° 104	[illegible]	[illegible]	192	[illegible]	346	423	500	576	653	730	[illegible]	884	961	1038	1115	1192
[illegible]	[illegible]	4	[illegible]	44	314	384	464	624	594	664	734	804	874	944	1013	1083
60° 108	[illegible]	[illegible]	160	[illegible]	288	352	416	480	544	608	[illegible]	[illegible]	801	865	929	993
[illegible]	[illegible]	[illegible]	4	[illegible]	[illegible]	325	[illegible]	443	[illegible]	[illegible]	[illegible]	[illegible]	739	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] 4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	282	[illegible]	384	435	487	538	589	641	692	743	794
[illegible] 116	[illegible]	[illegible]	120	168	216	264	312	360	[illegible]	456	504	[illegible]	600	649	697	745
[illegible] 118	[illegible]	[illegible]	113	158	203	248	294	339	384	429	475	520	565	610	656	701
48° 120	[illegible]	94	136	149	192	235	277	320	363	405	448	491	534	576	619	662
[illegible] 122	[illegible]	[illegible]	[illegible]	141	182	222	263	303	344	384	425	465	506	546	587	627
44° 124	19	[illegible]	96	134	173	211	250	288	326	365	403	442	480	519	557	596
42° 126	18	54	91	128	164	201	238	274	311	347	384	421	457	494	531	567
40° 128	17	[illegible]	87	122	157	192	227	262	297	332	367	402	437	472	506	541
38° 130	16	[illegible]	83	117	150	183	217	250	284	317	351	384	418	451	484	518
36° 132	16	48	80	112	144	176	208	240	272	304	336	368	400	432	464	496
34° 134	15	46	76	107	138	169	200	230	261	292	323	353	384	415	446	476
32° 136	14	44	73	103	133	162	192	221	251	281	310	340	369	399	428	458

HOLMES & NARVER, INC. ENGINEERS

GRADE SHEETS

CALC. BY

CHECKED BY _____ DATE _____

JOB NO _____

LOCATION _____

STA.	GRADE	ELEV.	CUT	FILL	STA.	GRADE	ELEV.	CUT	FILL

022
Sub 17

HOLMES & NARVER, INC. ENGINEERS

GRADE SHEETS

CALC. BY _____ JOB NO _____

CHECKED BY _____ DATE _____ LOCATION _____

STA.	GRADE	ELEV.	CUT	FILL	STA.	GRADE	ELEV.	CUT	FILL

HOLMES & NARVER INC., LOS ANGELES JOB NO.

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION LOCATION

CHIEF OF PARTY

DATE

DISTANCES AND DIRECTIONS TO REFERENCE MARKS

OBJECT	DISTANCE METERS	DISTANCE FEET	DIRECTION	AZIMUTH

ELEV. OF MARK ABOVE MEAN

HEIGHT OF TELESCOPE ABOVE MARK

HEIGHT OF LIGHT ABOVE MARK

DETAILED DESCRIPTION

DESCRIBED BY

MARKED BY

234

HOLMES & NARVER INC., ENGINEERS JOB NO_____

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION_____ LOCATION_____

CHIEF OF PARTY_____

DATE_____

DISTANCES AND DIRECTIONS TO REFERENCE MARKS				
OBJECT	DISTANCE		DIRECTION	AZIMUTH
	METERS	FEET		

ELEV. OF MARK ABOVE MLWS_____

HEIGHT OF TELESCOPE ABOVE MARK_____

HEIGHT OF LIGHT ABOVE MARK_____

DETAILED DESCRIPTION.

DESCRIBED BY_____ MARKED BY:_____

225

Degrees						Minutes		Seconds	
0°	0.0000000000						0'	0.0000000000	0"	0.0000000000
1	0.0174532925						1	.0002908882	1	0.0000048481
2	0.0349065850						2	.0005817764	2	0.0000096963
3	0.0523598776						3	.0008726646	3	0.0000145444
4	0.0698131701						4	.0011635528	4	0.0000193925
5	0.0872664626						5	.0014544410	5	0.0000242407
6	0.1047197551						6	.0017453293	6	0.0000290888
7	0.1221730476						7	.0020362175	7	0.0000339370
8	0.1396263402						8	.0023271057	8	0.0000387851
9	0.1570796327						9	.0026179939	9	0.0000436332
10	0.1745329252						10	.0029088821	10	0.0000484814
11	0.1919862177						11	.0031997703	11	0.0000533295
12	0.2094395102						12	.0034906585	12	0.0000581776
13	0.2268928028						13	.0037815467	13	0.0000630258
14	0.2443460953						14	.0040724349	14	0.0000678739
15	0.2617993878						15	.0043633231	15	0.0000727221
16	0.2792526803						16	.0046542113	16	0.0000775702
17	0.2967059728						17	.0049450995	17	0.0000824183
18	0.3141592654						18	.0052359878	18	0.0000872665
19	0.3316125579						19	.0055268760	19	0.0000921146
20	0.3490658504						20	0.0058177642	20	0.0000969627
21	0.3665191429						21	0.0061086524	21	0.0001018109
22	0.3839724354						22	0.0063996406	22	0.0001066590
23	0.4014257280						23	0.0066904288	23	0.0001115071
24	0.4188790205						24	0.0069813170	24	0.0001163553
25	0.4363323130						25	0.0072722052	25	0.0001212034
26	0.4537856055						26	0.0075630934	26	0.0001260516
27	0.4712388980						27	0.0078539816	27	0.0001308997
28	0.4886921906						28	0.0081448698	28	0.0001357478
29	0.5061454831						29	0.0084357581	29	0.0001405960
30	0.5235987756						30	0.0087266463	30	0.0001454441
31	0.5410520681						31	0.0090175345	31	0.0001502922
32	0.5585053606						32	0.0093084227	32	0.0001551404
33	0.5759586532						33	0.0095993109	33	0.0001599885
34	0.5934119457						34	0.0098901991	34	0.0001648367
35	0.6108652382						35	0.0101810873	35	0.0001696848
36	0.6283185307						36	0.0104719755	36	0.0001745329
37	0.6457718232						37	0.0107628637	37	0.0001793811
38	0.6632251158						38	0.0110537519	38	0.0001842292
39	0.6806784083						39	0.0113446401	39	0.0001890773
40	0.6981317008						40	0.0116355283	40	0.0001939255
41	0.7155849933						41	0.0119264166	41	0.0001987736
42	0.7330382858						42	0.0122173048	42	0.0002036217
43	0.7504915784						43	0.0125081930	43	0.0002084699
44	0.7679448709						44	0.0127990812	44	0.0002133180
45	0.7853981634						45	0.0130899694	45	0.0002181662
46	0.8028514559						46	0.0133808576	46	0.0002230143
47	0.8203047484						47	0.0136717458	47	0.0002278624
48	0.8377580410						48	0.0139626340	48	0.0002327106
49	0.8552113335						49	0.0142535222	49	0.0002375587
50	0.8726646260						50	0.0145444104	50	0.0002424068
51	0.8901179185						51	0.0148352986	51	0.0002472550
52	0.9075712110						52	0.0151261869	52	0.0002521031
53	0.9250245036						53	0.0154170751	53	0.0002569513
54	0.9424777961						54	0.0157079633	54	0.0002617994
55	0.9599310886						55	0.0159988515	55	0.0002666475
56	0.9773843811						56	0.0162897397	56	0.0002714957
57	0.9948376736						57	0.0165806279	57	0.0002763438
58	1.0122909662						58	0.0168715161	58	0.0002811919
59	1.0297442587						59	0.0171624043	59	0.0002860401
60	1.0471975512						60	0.0174532925	60	0.0002908882

TEMPERATURE CORRECTION - STEEL TAPE

CALIBRATED AT 76°

		0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
4°	78	324	1153	1962	2892	3961	4220	5002	5769	6536	7307	8075	8846	9615	10384	11153	11923
	80																
	82																
	84																
	86																
	88																
	90																
	92																
	94																
	96																
	98																
	100																
	102																
	104																
	106																
	108																
	110																
	112																
	114																
	116																
34°	118																
32°	120																
	122																
28°	124																
26°	126																
24°	128																

2.27
Sub 20

S-35

TEMPERATURE CORRECTION - STEEL TAPE
CALIBRATED AT 76°

	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
[illegible]	[illegible]	[illegible]	[illegible]	2632	3481	4330	5000	5769	6538	7307	8076	8846	9615	10384	11153	11923
[illegible]	[illegible]	[illegible]	[illegible]	1746	2115	[illegible]	[illegible]	2884	3269	3653	4038	4423	4807	5192	5576	5961
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1442	[illegible]	1826	2014	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	448	[illegible]	705	833	961	[illegible]	1217	1346	[illegible]	1602	1730	1858	1987
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	394	434	[illegible]	514	554	594	[illegible]	[illegible]	1373	1483	1593	1703
[illegible]	42	43	44	240	336	432	528	[illegible]	721	817	913	[illegible]	1201	1298	1394	1490
58	94	13	128	217	306	384	470	555	641	726	811	897	982	1068	1153	1239	1324
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	746	423	[illegible]	576	[illegible]	[illegible]	[illegible]	864	[illegible]	1038	[illegible]	1192
54	98	[illegible]	[illegible]	[illegible]	344	[illegible]	584	454	[illegible]	[illegible]	664	[illegible]	[illegible]	774	844	[illegible]	1083
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4	[illegible]	[illegible]	41[illegible]	[illegible]	[illegible]	344	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	325	[illegible]	44[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	41	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9	[illegible]	282	[illegible]	384	436	487	[illegible]	589	641	692	743	794
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	216	264	312	360	408	456	504	[illegible]	600	649	697	745
120°110	[illegible]	[illegible]	213	158	203	248	294	339	384	429	476	520	565	610	656	701
120°112	[illegible]	54	[illegible]	149	192	235	279	320	363	405	448	491	534	576	619	662
118°114	[illegible]	55	131	141	182	222	263	303	344	384	425	465	506	546	587	627
116°116	[illegible]	[illegible]	96	134	173	211	250	288	326	365	403	442	480	519	557	596
114°118	[illegible]	54	91	126	164	201	238	274	311	347	384	421	457	494	531	567
112°120	[illegible]	[illegible]	[illegible]	122	157	192	227	262	297	332	367	402	437	472	506	541
110°122	[illegible]	50	83	117	150	183	217	250	284	317	351	384	418	451	484	518
108°124	[illegible]	48	80	112	144	176	208	240	272	304	336	368	400	432	464	496
106°126	[illegible]	46	76	107	138	169	200	230	261	292	323	353	384	415	446	476
104°128	[illegible]	44	[illegible]	103	133	162	192	221	251	281	310	340	369	399	428	458

Sue 20

HOLMES & NARVER INC., ENGINEERS

JOB No. ____

LIST OF DIRECTIONS

STATION ____ DATE ____

CHIEF OF PART ____ COMPUTED BY ____

OBSERVER ____ CHECKED BY ____

OBSERVED STATION	OBSERVED DIRECTION	REC RED	SEA LEVEL RED	CORRECTED DIR. ZERO INITIAL	ADJ. DIR.
	0°00'00.00"			0°00'00.00"	

HOLMES & NARVER INC., ENGINEERS

JOB NO. ____

LIST OF DIRECTIONS

STATION _____ DATE _____

CHIEF OF PARTY _____ COMPUTED BY _____

OBSERVER _____ CHECKED BY _____

OBSERVED STATION	OBSERVED DIRECTION	ECC. RED.	SEA LEVEL RED.	CORRECTED DIR. ZERO INITIAL	ADJ. DIR.
	0° 00' 00.00"			0° 00' 00.00"	

230 Fini

HOLMES & NARVER INC. ENGINEERS

JOB NO. ____

ABSTRACT OF DIRECTIONS

STATION _____ COMPUTED BY _____ DATE _____

OBSERVER _____ CHECKED BY _____ INST. _____

POSITION	STATIONS OBSERVED				
	INITIAL 0° 00'				
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
SUM					
MEAN					
CORR. FOR ECC.					
DIRECTION					

HOLMES & NARVER INC., ENGINEERS

JOB NO. ____

ABSTRACT OF DIRECTIONS

STATION _____ COMPUTED BY _____ DATE _____

OBSERVER _____ CHECKED BY _____ INST. _____

POSITION	STATIONS OBSERVED					
	INITIAL 0° 00′					
1	0.00"					
2	0.00"					
3	0.00"					
4	0.00"					
5	0.00"					
6	0.00					
7	0.00"					
8	0.00					
9	0.00"					
10	0.00"					
11	0.00"					
12	0.00"					
13	0.00"					
14	0.00"					
15	0.00"					
16	0.00"					
SUM						
MEAN						
CORR. FOR ECC.						
DIRECTION						

TEMPERATURE RRECTION TABLE

Coefficient of Expansion - 0.0000011

Standard Temperature - 20°C

Indicated corrections are decimal parts of a meter in the 5th place and are plus for temperatures above 20°

LENGTH IN METERS

TEMP. C°	1	2	3	4	5	10	15	20	25	30	35	40	45	50
21							1	1	1	1	1	2	2	2
22						1	1	2	2	2	3	3	4	4
23					1	1	2	2	3	4	4	5	5	6
24				1	1	2	2	3	4	5	6	6	7	8
25			[illegible]	[illegible]	[illegible]	2	3	4	5	6	7	8	9	10
26				[illegible]	[illegible]	2	4	5	6	7	8	10	11	12

CONVERSION TABLE

FEET to	METERS
1	.3048006
2	.6096012
7	2.1336043
8	2.4384049
9	2.7432055
10	3.0480061
20	6.096…

233

TEMPERATURE CORRECTION TABLE

Coefficient of Expansion - 0.000006
Standard Temperature - 20° C
Indicated corrections are decimal parts of a meter in the 5th place and are plus for temperatures above 20°

	LENGTH IN METERS													
TEMP. C°	1	2	3	4	5	10	15	20	25	30	35	40	45	50
21							1	1	1	1	1	2	2	2
22						1	1	2	2	2	3	3	4	4
23					1	1	2	2	3	4	4	5	5	6
24				1	1	2	2	3	4	5	6	6	7	8
25			1	1	1	2	3	4	5	6	7	8	9	10
26			1	1	1	2	4	5	6	7	8	10	11	12
27			1	1	1	3	4	6	7	8	10	11	13	14
28			1	1	2	3	5	6	8	10	11	13	14	16
[illegible]			1	1	2	4	5	7	9	11	13	14	16	18
[illegible]			1	2	2	4	6	8	10	12	14	16	18	20
[illegible]			1	2	2	4	7	9	11	13	16	18	20	22
[illegible]			1	2	2	5	7	10	12	14	17	19	22	24
[illegible]			2	2	3	5	8	10	13	16	18	21	23	26
[illegible]		1	2	2	3	6	8	11	14	17	20	22	25	28
[illegible]		1	2	3	3	6	9	12	15	18	21	24	27	30
[illegible]		1	2	3	3	6	10	13	16	19	23	26	29	32
[illegible]		1	2	3	3	7	10	14	17	20	24	27	31	34
[illegible]		1	2	3	4	7	11	14	18	22	26	29	32	36
[illegible]		1	2	3	4	8	11	15	19	23	27	30	34	38
[illegible]		1	2	3	4	8	12	16	20	24	28	32	36	40
[illegible]		1	2	3	4	8	13	17	21	25	29	34	38	42
[illegible]		1	2	3	4	9	13	18	22	26	31	35	40	44
[illegible]		1	2	3	4	9	14	18	23	28	32	37	41	46
[illegible]		1	2	3	4	10	14	19	24	29	34	38	43	48
[illegible]		1	2	3	4	10	15	20	25	30	35	40	45	50

CONVERSION TABLE

FEET	to	METERS
1		.3048006
2		.6096012
3		.9144018
4		1.2192024
5		1.5240030
6		1.8288037
7		2.1336043
8		2.4384049
9		2.7432055
10		3.0480061
20		6.0960122
30		9.1440183
40		12.1920244
50		15.2400305
60		18.2880365
70		21.3360426
80		24.3840487
90		27.4320548
100		30.4800609

934

TEMPERATURE CORRECTION TABLE

Coefficient of Expansion - 0.0000004
Standard Temperature - 20° C.
Indicated corrections are decimal parts of a meter in the 5th place and are plus for temperature above 20°

	LENGTH IN METERS													
TEMP C°	1	2	3	4	5	10	15	20	25	30	35	40	45	50
21							1	1	1	1	1	2	2	2
22						1	1	2	2	2	3	3	4	4
[illegible]					1	1	2	2	3	4	4	5	5	6
[illegible]				1	1	2	2	3	4	5	6	6	7	8
[illegible]					1	2	3	4	5	6	7	8	9	10
[illegible]					2	2	4	5	6	7	8	10	11	12
[illegible]					2	3	4	6	7	8	10	11	13	14
28			1	1	2	3	5	6	8	10	11	13	14	16
29			1	1	2	4	5	7	9	11	13	14	16	18
30		1	1	2	2	4	6	8	10	12	14	16	18	20
[illegible]		1	1	2	2	4	7	9	11	13	16	18	20	22
[illegible]		1	1	2	3	5	7	10	12	14	17	19	22	24
[illegible]		1	2	2	3	5	8	10	13	16	18	21	23	26
[illegible]		1	2	2	3	6	8	11	14	17	20	22	25	28
[illegible]		1	2	2	4	6	9	12	15	18	21	24	27	30
[illegible]		1	2	3	4	6	10	13	16	19	23	26	29	32
[illegible]		1	2	3	4	7	10	14	17	20	24	27	31	34
[illegible]		1	2	3	4	7	11	14	18	22	26	29	32	36
40		1	2	3	4	8	12	16	20	24	28	32	36	40
[illegible]		1	2	3	4	8	13	17	21	25	29	34	38	42
42	1	2	3	4	4	9	13	18	22	26	31	35	40	44
43	1	2	3	4	5	9	14	18	23	28	32	37	41	46
44	1	2	3	4	5	10	14	19	24	29	34	38	43	48
45	1	2	3	4	5	10	15	20	25	30	35	40	45	50

CONVERSION TABLE

FEET	METERS
1	.3048006
2	.6096012
3	.9144018
4	1.2192024
5	1.5240030
6	1.8288037
7	2.1336043
8	2.4384049
9	2.7432055
10	3.0480061
20	6.0960122
30	9.1440183
40	12.1920244
50	15.2400305
60	18.2880365
70	21.3360426
80	24.3840487
90	27.4320548
100	30.4800609

JOB NO

PARTY:

SITE:

WEEKLY WORK REPORT

WEEK ENDING

	SITE	DESCRIPTION OF WORK	REMARKS
MONDAY			
TUESDAY			
WEDNESDAY			
THURSDAY			
FRIDAY			
SATURDAY			
SUNDAY			

JOB NO. _____ HOLMES & NARVER PARTY:

SITE: _____ SURVEY DEPARTMENT

WEEKLY WORK REPORT

WEEK ENDING _____

	SITE	DESCRIPTION OF WORK	REMARKS
MONDAY			
TUESDAY			
WEDNESDAY			
THURSDAY			
FRIDAY			
SATURDAY			
SUNDAY			

237

JOB Nº _____

HOLMES & NARVER INC., ENGINEERS

INVERSE POSITION COMPUTATION

NAME OF STATION

1. ϕ		λ	° ' "
2. ϕ'		λ'	
$\Delta\phi\ (=\phi'-\phi)$		$\Delta\lambda\ (=\lambda'-\lambda)$	
$\frac{\Delta\phi}{2}$		$\frac{\Delta\lambda}{2}$	
$\phi_m\ (=\phi+\frac{\Delta\phi}{2})$			
$\Delta\phi$ (secs)			
log $\Delta\phi$		log $\Delta\lambda$	
cor. arc − sin		log cos ϕ_m	
log $\Delta\phi_1$		colog A_1	
log cos $\frac{\Delta\lambda}{2}$		log $\{s_1 \sin(\alpha+\frac{\Delta\alpha}{2})\}$	
colog B_m		log $\{s_1 \cos(\alpha+\frac{\Delta\alpha}{2})\}$	
log $\{s_1 \cos(\alpha+\frac{\Delta\alpha}{2})\}$		log tan $(\alpha+\frac{\Delta\alpha}{2})$	
log $\Delta\lambda$		$\frac{\Delta\lambda}{2}$	
log sin ϕ_m		log $\sin(\alpha+\frac{\Delta\alpha}{2})$	
log sec $\frac{\Delta\phi}{2}$		log $\cos(\alpha+\frac{\Delta\alpha}{2})$	
log a		log s_1	
a		log $\frac{\Delta\alpha}{\Delta\alpha_m}$	
b			
$-\Delta\alpha$ (secs)			
$-\frac{\Delta\alpha}{2}$			
$\alpha+\frac{\Delta\alpha}{2}$			
α (1 to 2)			
$\Delta\alpha$			
α' (2 to 1)			

JOB Nº ____

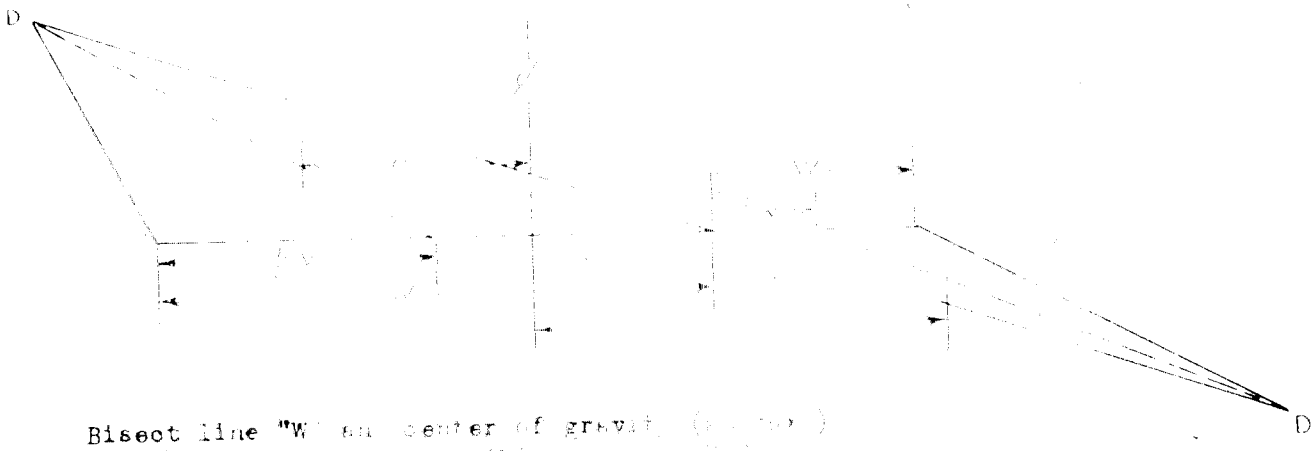
HOLMES & NARVER INC. ENGINEERS

INVERSE POSITION COMPUTATION

NAME OF STATION

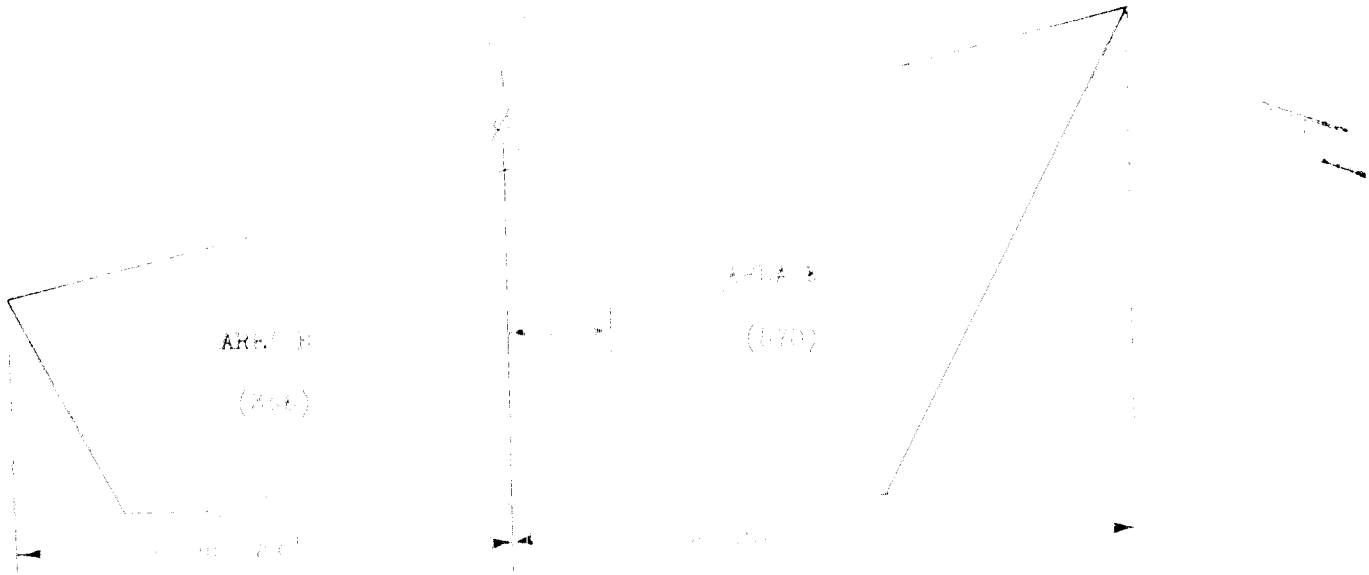
1 ϕ			λ		
2 ϕ'			λ'		
$\Delta\phi\ (=\phi'-\phi)$			$\Delta\lambda\ (=\lambda'-\lambda)$		
$\frac{\Delta\phi}{2}$			$\frac{\Delta\lambda}{2}$		
$\phi_m\ (=\phi+\frac{\Delta\phi}{2})$					
$\Delta\phi$ (secs)			$\Delta\lambda$ (secs)		
log $\Delta\phi$			log $\Delta\lambda$		
cor. arc − sin			cor. arc − sin		
log $\Delta\phi_1$			log $\Delta\lambda_1$		
log cos $\frac{\Delta\lambda}{2}$			log cos ϕ_m		
colog B_m			colog h_m		
log $\{s_1 \cos(\alpha+\frac{\Delta\alpha}{2})\}$		(opposite in sign to $\Delta\phi$)	log $\{s_1 \sin(\alpha+\frac{\Delta\alpha}{2})\}$		
			log $\{s_1 \cos(\alpha+\frac{\Delta\alpha}{2})\}$		
log $\Delta\lambda$		3 log $\Delta\lambda$	log tan $(\alpha+\frac{\Delta\alpha}{2})$		
log sin ϕ_m		log k	$\alpha+\frac{1}{2}\Delta\alpha$		
log sec $\frac{\Delta\phi}{2}$		log h	log sin $(\alpha+\frac{\Delta\alpha}{2})$		
log a			log cos $(\alpha+\frac{\Delta\alpha}{2})$		
a			log s_1		
b					
$-\Delta\alpha$ (secs)					
$-\frac{\Delta\alpha}{2}$					
$\alpha+\frac{\Delta\alpha}{2}$					
α (1 to 2)					
$\Delta\alpha$					
	INC				
α' (2 to 1)					

239
SUE 25



Bisect line "W" on center of gravity ( )
is 1/3 the distance from this point

Eccentricity of the section is the distance
the center of gravity to centerline.



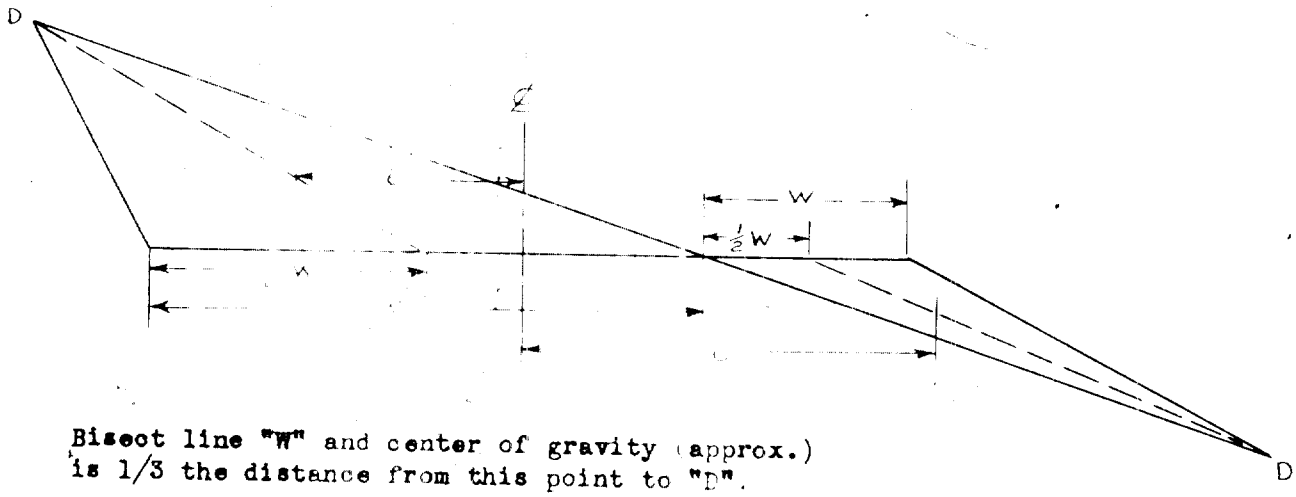
$$e = \frac{M \cdot S}{3I} \quad (\quad)$$

$$= \frac{\quad}{\quad} \times 12 = \quad \text{in.}$$

Determine area of sections each side of the centerline.
Scale the distance from centerline to top of one or each
side and apply the formula.

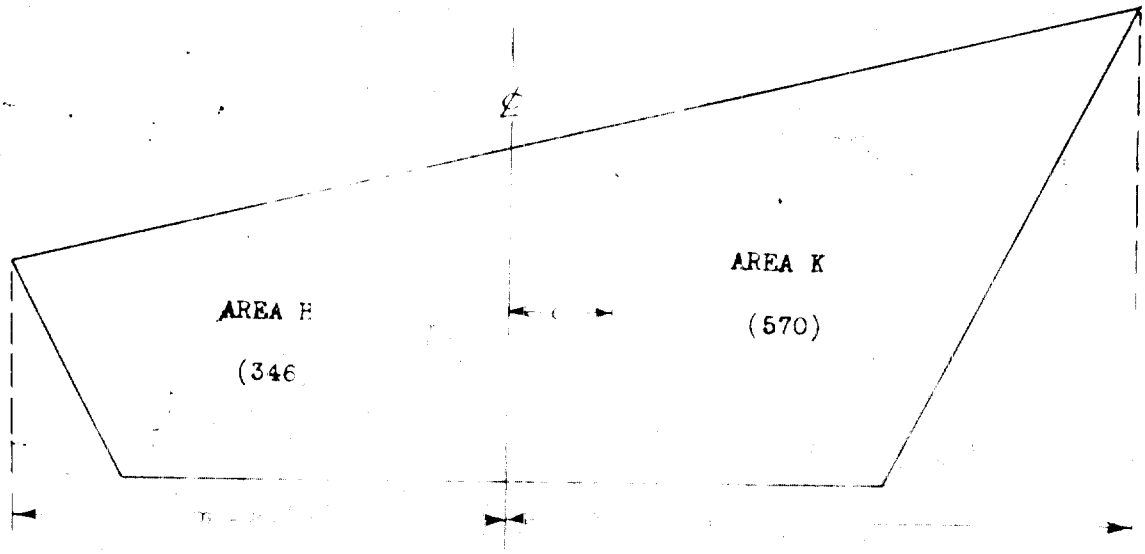
COMPENSATION FOR CURVATURE - [illegible] CARLAGE CALCULATIONS

ECCENTRICITY OF CENTER OF GRAVITY OF SECTION



Bisect line "W" and center of gravity (approx.) is 1/3 the distance from this point to "D".

Eccentricity of the section is the distance from the center of gravity to centerline.



$$e = \frac{n+m}{3A}(K-E)$$

E = 346
K = 570
Sum [illegible] Diff. = 224

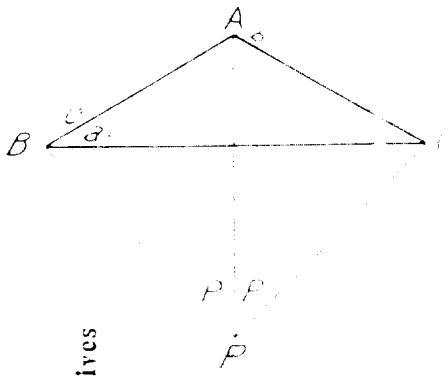
$$e = \frac{69}{2448} \times 2.4 \text{ [illegible]}$$

Determine area of sections each side of the centerline. Scale the distance from center line to [illegible] of cut on each side and apply the formula.

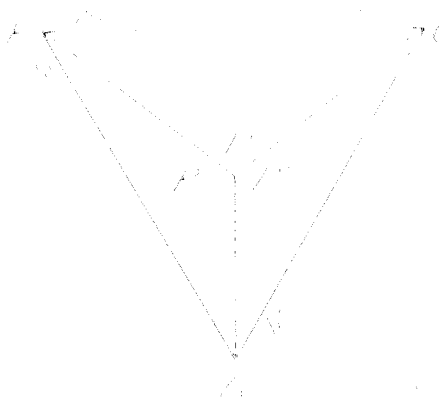
2.41
SUE 26

CONSTRUCTION OF THREE POINT PROBLEM

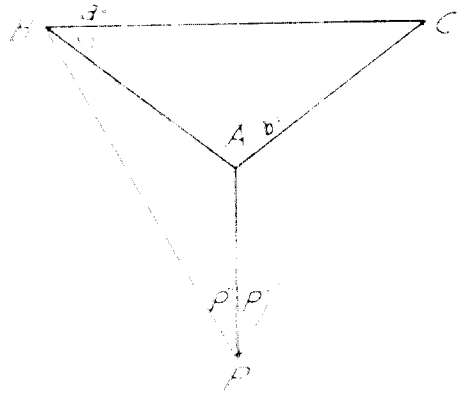
CASE 1



CASE 2



CASE 3



CASE 1 & 2

P

P''

A

SUM

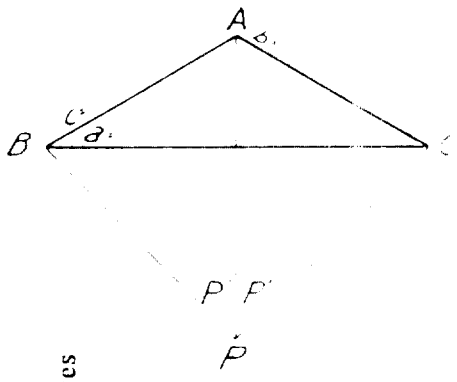
SUM

S: 180° - ½ SUM

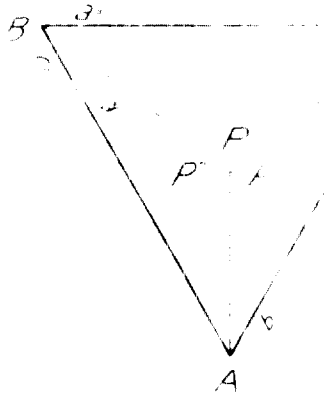
CASE 3

COMPUTATION OF [illegible] PROBLEM

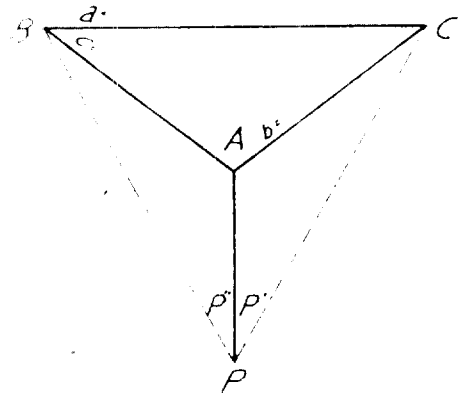
CASE 1



CASE 2



CASE 3



CASE 1 & 2	CASE 3
P'	
P''	
A	
SUM	
SUM	
S = 180° - ½ SUM =	S = ½ (A - SUM) =

LOG c	
LOG SIN P'	
COLOG b	
COLOG SIN P''	
SUM = LOG TAN Z =	
Z = A'	
LOG COT (Z + 45°)	
LOG TAN S	
SUM = LOG TAN (c +	
(LOG c)	(LOG c)
S + c = ANGLE MAP	S + c = ANGLE ARP
S - c = ANGLE MAP	S - c = ANGLE ACP

SURVEY EQUIPMENT
PARTY CHIEF'S INVENTORY
PROPERTY FILE

DATE

ITEM	MFR & SERIAL NO	H.B.S. NO	AEC NO	CONDITION
TRANSIT				
LEVEL				
THEODOLITE				
SEXTANT				
BINOCULARS				
ALIDADE				
PLANE TABLE W/TRIPOD				
TRIPOD, STEEL				
TRIPOD, ADJUSTABLE				

	MAKE	TYPE	AEC NO
VEHICLE			

THE ABOVE EQUIPMENT IS IN MY CUSTODY

SIGNED

TITLE

SURVEY DEPARTMENT
PARTY CHIEF'S INVENTORY
PROPERTY ITEMS

DATE

ITEM	MFR & SERIAL NO	H & N NO	AEC NO	CONDITION
TRANSIT				
LEVEL				
THEODOLITE				
SEXTANT				
BINOCULARS				
ALIDADE				
PLANE TABLE W/ TRIPOD				
TRIPOD, STIFF-LEG				
TRIPOD, ADJUSTABLE				
	MAKE	TYPE	AEC NO	
VEHICLE				

THE ABOVE EQUIPMENT IS IN MY CUSTODY.

ATOLL
245

SURVEY DEPARTMENT
PARTY CHIEF'S INVENTORY
NON-PROPERTY ITEMS

DATE _____

ITEM	QUAN	CONDITION	ITEM	QUAN	CONDITION
TAPE, STEEL, 100'			WATER JUGS, 5 GAL		
TAPE, STEEL, 300'			COFFEE JUGS, 1 GAL		
TAPE, CLOTH			HATCHETS		
HAND LEVELS					
LEVEL RODS					
LEVEL ROD LEVELS					
THERMOMETERS					
READING GLASSES					
TENSION HANDLES					
TAPE CLAMPS					
BOOK BAGS					
PLUMB BOBS					
PLUMB BOB SHEATHS					
AXES					
BRUSH HOOKS					
SLEDGES					
STAKE BAGS					
SHOVELS					
STEEL DIES, NUMBERS					
STEEL DIES, LETTERS					
HAMMERS					
PLIERS					

THE ABOVE EQUIPMENT IS IN MY CUSTODY.

SIGNED

TITLE

ATOLL

246

SURVEY DEPARTMENT
PARTY CHIEFS INVENTORY
NON PROPERTY ITEMS

DATE _____

ITEM	QUAN	CONDITION	ITEM	QUAN	CONDITION
TAPE, STEEL, 100'			WATER JUGS, 5 GAL.		
TAPE, STEEL, 300			COFFEE JUGS, 1 GAL.		
TAPE, CLOTH			HATCHETS		
HAND LEVELS					
LEVEL RODS					
LEVEL ROD LEVELS					
THERMOMETERS					
READING GLASSES					
TENSION HANDLES					
TAPE CLAMPS					
BOOK BAGS					
PLUMB BOBS					
PLUMB BOB SHEATHS					
AXES					
BRUSH HOOKS					
SLEDGES					
STAKE BAGS					
SHOVELS					
STEEL DIES, NUMBERS					
STEEL DIES, LETTERS					
HAMMERS					
PLIERS					

THE ABOVE EQUIPMENT IS IN MY CUSTODY

SIGNED

ATOLL

247

VOLUME IN [illegible] 2001

Acres									
1	161.3	177.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	129.1	145.2
2	322.7	338.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	290.4	306.5
3	484.0	500.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	451.7	467.9
4	645.3	661.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	613.1	629.2
5	806.7	822.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	774.4	790.5
6	968.0	984.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	935.7	951.9
7	1129	1145	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1097	1113
8	1291	1307	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1258	1275
9	1452	1468	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1420	1436
10	1613	1629	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1742	1759
11	1775	1791	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1920
12	1936	1952	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2065	2081
13	2097	2113	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2226	2243
14	2259	2275	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2404
15	2420	2436	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2565
16	2581	2597	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2727
17	2743	2759	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2872	2888
18	2904	2920	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3033	3049
19	3065	3081	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3194	3211
20	3227	3243	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3372
21	3388	3404	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3533
22	3549	3565	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3675	3695
23	3711	3727	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3856
24	3872	3888	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4001	4017
25	4033	4049	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4162	4178
26	4195	4211	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4340
27	4356	4372	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4501
28	4517	4533	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4663
29	4679	4695	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4824
30	4840	4856	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4985
31	5001	5017	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5147
32	5163	5179	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5308
33	5324	5340	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5469
34	5486	5501	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5631
35	5647	5663	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5792
36	5808	5824	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5953
37	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
38	6131	6114	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6276
39	6292	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6437
40	6453	6469	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6598
41	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
42	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
43	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
44	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
45	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
46	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
47	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
48	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
49	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] 615 333 cu-yds. per 40 ft. = 161.773 per 0.1 ft.

TEMPERATURE CORRECTION TABLE

Coefficient of Expansion - 0.0000004
Standard Temperature - 20° C.
Indicated corrections are decimal parts of a meter in the 5th place and are plus for temperature above 20°

TEMP C°	LENGTH IN METERS													
	0	1	2	3	4	5	10	15	20	25	30	35	40	45	50
0									1	1	1	2	2	2
1								1	1	2	2	2	3	3
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
31														
32														
33														
34														
35														
36														
37														
38														
39														
40														
41														
42														
43														
44														
45														
46														
47														
48														
49														
50														

CONVERSION TABLE

Meters	Feet
1	3.280833
2	6.561667
3	9.842500
4	13.123333
5	16.404167
6	19.685000
7	22.965833
8	26.246667
9	29.527500
10	32.808333
20	65.616667
30	98.425000
40	131.233333
50	164.041667
60	196.850000
70	229.658333
80	262.466667
90	295.275000
100	328.083333

Degrees						Minutes		Seconds	
0°	0.0000000000	60°	1.047197[illegible]5812	120°	2.094[illegible]51024	0′	0.0000000000	0″	0.0000000000
1	0.0174532925	61	1.064[illegible]8437	121	2.[illegible]6[illegible]3949	1	0.0002908882	1	0.0000048481
2	0.0349065850	62	1.08[illegible]41362	122	2.1[illegible]6874	2	0.0005817764	2	0.0000096963
3	0.0523598776	63	1.[illegible]9884288	123	2.1467[illegible]9800	3	0.0008726646	3	0.0000145444
4	0.0698131701	64	1.1[illegible]7213	124	2.1642[illegible]2728	4	0.0011635528	4	0.0000193925
5	0.0872664626	65	1.[illegible]344640138	125	2.1816[illegible]5650	5	0.0014544410	5	0.0000242407
6	0.1047197551	66	1.[illegible]5191[illegible]3063	126	2.1991[illegible]48578	6	0.0017453293	6	0.0000290888
7	0.1221730476	67	1.[illegible]883706988	127	2.2165[illegible]81500	7	0.0020362175	7	0.0000339370
8	0.1396263402	68	1.[illegible]568238914	128	2.2340[illegible]14426	8	0.0023271057	8	0.0000387851
9	0.1570796327	69	1.[illegible]042771839	129	2.2514[illegible]47351	9	0.0026179939	9	0.0000436332
10	0.1745329252	70	1.[illegible]217304764	130	2.2689[illegible]80276	10	0.0029088821	10	0.0000484814
11	0.1919862177	71	1.[illegible]391837689	131	2.2863[illegible]13201	11	0.0031997703	11	0.0000533295
12	0.2094395102	72	1.[illegible]566370614	132	2.3038[illegible]46126	12	0.0034906585	12	0.0000581776
13	0.2268928028	73	1.[illegible]740903540	133	2.3212[illegible]79052	13	0.0037815467	13	0.0000630258
14	0.2443460953	74	1.[illegible]915436465	134	2.3387[illegible]11977	14	0.0040724349	14	0.0000678739
15	0.2617993878	75	1.[illegible]089969390	135	2.3561[illegible]44902	15	0.0043633231	15	0.0000727221
16	0.2792526803	76	1.[illegible]264502315	136	2.[illegible][illegible]7827	16	0.0046542113	16	0.0000775702
17	0.2967059728	77	1.3439035240	137	2.[illegible]10752	17	0.0049450995	17	0.0000824183
18	0.3141592654	78	1.[illegible]613568166	138	2.4[illegible]43678	18	0.0052359878	18	0.0000872665
19	0.3316125579	79	1.3788101091	139	2.4260076603	19	0.0055268760	19	0.0000921146
20	0.3490658504	80	1.3962634016	140	2.4434609528	20	0.0058177642	20	0.0000969627
21	0.3665191429	81	1.4[illegible]37166941	141	2.4609142453	21	0.0061086524	21	0.0001018109
22	0.3839724354	82	1.4[illegible]11699866	142	2.4[illegible]75378	22	0.0063995406	22	0.0001066590
23	0.4014257280	83	1.4486232792	143	2.4958208304	23	0.0066904288	23	0.0001115071
24	0.4188790205	84	1.4660765717	144	2.5[illegible]32741229	24	0.0069813170	24	0.0001163553
25	0.4363323130	85	1.4[illegible]35298642	145	2.5307274154	25	0.0072722052	25	0.0001212034
26	0.4537856055	86	1.[illegible]09831567	146	2.[illegible]7079	26	0.0075630934	26	0.0001260516
27	0.4712388980	87	1.5184364492	147	2.5656340004	27	0.0078539816	27	0.0001308997
28	0.4886921906	88	1.[illegible]56897418	148	2.[illegible]72930	28	0.0081448698	28	0.0001357478
29	0.5061454831	89	1.5533430343	149	2.6006405855	29	0.0084357581	29	0.0001405960
30	0.5235987756	90	1.5707963268	150	2.6179938780	30	0.0087266463	30	0.0001454441
31	0.5410520681	91	1.[illegible]882496193	151	2.6353471705	31	0.0090175345	31	0.0001502922
32	0.5585053606	92	1.[illegible]57029118	152	2.[illegible]4630	32	0.0093084227	32	0.0001551404
33	0.5759586532	93	1.[illegible]231562044	153	2.[illegible]7556	33	0.0095993109	33	0.0001599885
34	0.5934119457	94	1.[illegible]06094969	154	2.[illegible]0481	34	0.0098901991	34	0.0001648367
35	0.6108652382	95	1.[illegible]80627894	155	2.[illegible]3406	35	0.0101810873	35	0.0001696848
36	0.6283185307	96	1.[illegible][illegible]819	156	2.[illegible]6331	36	0.0104719755	36	0.0001745329
37	0.6457718232	97	1.6929693744	157	2.[illegible]9256	37	0.0107628637	37	0.0001793811
38	0.6632251158	98	1.[illegible]04226670	158	2.[illegible]2182	38	0.0110537519	38	0.0001842292
39	0.6806784083	99	1.7278759595	159	2.[illegible]5107	39	0.0113446401	39	0.0001890773
40	0.6981317008	100	1.7453292520	160	2.7928278032	40	0.0116355283	40	0.0001939255
41	0.7155849933	101	1.[illegible]627825445	161	2.8[illegible]957	41	0.0119264166	41	0.0001987736
42	0.7330382858	102	1.[illegible]802358370	162	2.[illegible]3882	42	0.0122173048	42	0.0002036217
43	0.7504915784	103	1.[illegible]976891296	163	2.[illegible]6808	43	0.0125081930	43	0.0002084699
44	0.7679448709	104	1.[illegible]151424221	164	2.[illegible]9733	44	0.0127990812	44	0.0002133180
45	0.7853981634	105	1.[illegible]325957146	165	2.[illegible]2658	45	0.0130899694	45	0.0002181662
46	0.8028514559	106	1.[illegible]500490071	166	2.[illegible]5583	46	0.0133808576	46	0.0002230143
47	0.8203047484	107	1.[illegible]675022996	167	2.[illegible]8508	47	0.0136717458	47	0.0002278624
48	0.8377580410	108	1.[illegible]849555922	168	2.[illegible]1434	48	0.0139626340	48	0.0002327106
49	0.8552113335	109	1.[illegible]024088847	169	2.9496[illegible]4359	49	0.0142535222	49	0.0002375587
50	0.8726646260	110	1.9198621772	170	2.9670[illegible]7284	50	0.0145444104	50	0.0002424068
51	0.8901179185	111	1.[illegible]373154697	171	2.9845[illegible]	51	0.0148352986	51	0.0002472550
52	0.9075712110	112	1.9547687622	172	[illegible]	52	0.0151261869	52	0.0002521031
53	0.9250245036	113	1.[illegible]722220548	173	[illegible]	53	0.0154170751	53	0.0002569513
54	0.9424777961	114	1.[illegible]896753473	174	[illegible]	54	0.0157079633	54	0.0002617994
55	0.9599310886	115	2.[illegible]071286398	175	[illegible]	55	0.0159988515	55	0.0002666475
56	0.9773843811	116	2.[illegible]245819323	176	[illegible]	56	0.0162897397	56	0.0002714957
57	0.9948376736	117	2.[illegible]420352248	177	[illegible]	57	0.0165806279	57	0.0002763438
58	1.0122909662	118	2.[illegible]594885174	178	[illegible]	58	0.0168715161	58	0.0002811919
59	1.0297442587	119	2.0769418099	179	[illegible]	59	0.0171624043	59	0.0002860401
60	1.0471975512	120	2.0943951024	180	[illegible]	60	0.0174532926	60	0.0002908882

Sue 19

TEMPERATURE CORRECTION - STEEL TAPE
CALIBRATED AT 84°

	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
82° 86	384	1153	1923	2692	3461	4230	5000	5769	6538	7307	8076	8846	9615	10384	11153	11923
83° 87	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
84° 88	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
85° 89	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
86° 90	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
87° 91	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
88° 92	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
89° 93	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
90° 94	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
91° 95	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
92° 96	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
93° 97	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
94° 98	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
95° 99	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
96° 100	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
97° 101	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
98° 102	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
99° 103	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
100° 104	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
101° 105	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
102° 106	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
103° 107	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
104° 108	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
105° 109	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
106° 110	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
107° 111	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
108° 112	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
109° 113	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
110° 114	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
111° 115	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
112° 116	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
113° 117	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
114° 118	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
115° 119	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
116° 120	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
117° 121	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
118° 122	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
119° 123	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
120° 124	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
121° 125	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
122° 126	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
123° 127	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
124° 128	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
125° 129	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
126° 130	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
127° 131	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
128° 132	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
129° 133	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
130° 134	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
131° 135	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919
132° 136	384	1153	1922	2691	3460	4229	4998	5767	6536	7305	8074	8843	9612	10381	11150	11919

252
SUR16

CHORD AND DEFLECTION TABLE FOR CURVES OF STANDARD RADII

DEFL FOR 1' OF ARC = $\frac{1718.8733}{R}$

CHORD = 2R X SIN (DEFL FOR 1 ARC LENGTH)

RADIUS	LENGTH OF ARC	DEFLECTION FOR ONE ARC LENGTH	CHORD	DEFLECTION FOR A ONE FOOT ARC
[illegible]	[illegible]	[illegible]	24.384	22.91831'
100	[illegible]	[illegible]	24.385	17.18873'
125	[illegible]	[illegible]	24.388	13.75009'
150	[illegible]	[illegible]	24.392	11.45916'
175	[illegible]	[illegible]	24.397	9.82213'
200	[illegible]	[illegible]	24.404	8.59437'
225	[illegible]	[illegible]	24.412	7.63944'
250	[illegible]	[illegible]	24.422	6.87549'
275	[illegible]	[illegible]	24.432	6.25045'
300	[illegible]	[illegible]	24.443	5.72958'
325	[illegible]	[illegible]	24.454	5.28884'
350	[illegible]	[illegible]	24.466	4.91107'
375	[illegible]	[illegible]	24.478	4.58366'
400	[illegible]	[illegible]	24.491	4.29718'
425	[illegible]	[illegible]	24.504	4.04441'
450	[illegible]	[illegible]	24.517	3.81972'
475	[illegible]	[illegible]	24.530	3.61868'
500	[illegible]	[illegible]	24.543	3.43775'
525	[illegible]	[illegible]	24.557	3.27404'
550	[illegible]	[illegible]	24.570	3.12522'
575	[illegible]	[illegible]	24.584	2.98934'
600	[illegible]	[illegible]	24.598	2.86479'
700	[illegible]	[illegible]	24.654	2.45553'
800	[illegible]	[illegible]	24.710	2.14859'
900	[illegible]	[illegible]	24.766	1.90986'
1000	[illegible]	[illegible]	24.822	1.71887'
1100	[illegible]	[illegible]	24.878	1.56261'
1200	[illegible]	[illegible]	24.934	1.43239'
1300	[illegible]	[illegible]	24.990	1.32221'
1400	[illegible]	[illegible]	25.046	1.22777'
1500	[illegible]	[illegible]	25.102	1.14592'
1600	[illegible]	[illegible]	25.158	1.07430'
1700	[illegible]	[illegible]	25.214	1.01110'
1800	[illegible]	[illegible]	25.270	0.95493'
1900	[illegible]	[illegible]	25.326	0.90467'
2000	[illegible]	[illegible]	25.382	0.85944
2250	[illegible]	[illegible]	25.522	0.76394'
2500	[illegible]	[illegible]	25.662	0.68755'
2750	[illegible]	[illegible]	25.802	0.62504'
3000	[illegible]	[illegible]	25.942	0.57296'
3250	[illegible]	[illegible]	26.082	0.52868'
3500	[illegible]	[illegible]	26.222	0.49111'
3750	[illegible]	[illegible]	26.362	0.45837'
4000	[illegible]	[illegible]	26.502	0.42972'
4250	[illegible]	[illegible]	26.642	0.40444'
4500	[illegible]	[illegible]	26.782	0.38197'
4750	[illegible]	[illegible]	26.922	0.36187'
5000	[illegible]	[illegible]	27.062	0.34377'
5500	[illegible]	[illegible]	27.342	0.31252'
6000	[illegible]	[illegible]	27.622	0.28648'

S-34

TEMPERATURE CORRECTION - STEEL TAPE
CALIBRATED AT 68°

		0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
66°	70	384	1153	1923	2692	3461	4230	5000	5769	6538	7307	8076	8846	9615	10384	11153	11923
64°	72	192	576	961	1346	1730	2115	2500	2884	3269	3653	4038	4423	4807	5192	5576	5961
62°	74	128	384	641	897	1153	1410	1666	1923	2179	2436	2692	2948	3205	3461	3717	3974
60°	76	96	288	480	673	865	1057	1250	1442	1634	1827	2019	2211	2403	2596	2788	2980
58°	78	76	230	384	538	692	846	1000	1153	1307	1461	1615	1769	1923	2076	2230	2384
56°	80	64	192	320	448	576	705	833	961	1089	1217	1346	1474	1602	1730	1858	1987
54°	82	54	164	274	384	494	604	714	824	934	1043	1153	1263	1373	1483	1593	1703
52°	84	48	144	240	336	432	528	624	721	817	913	1009	1105	1201	1298	1394	1490
50°	86	42	128	213	299	384	470	555	641	726	811	897	982	1068	1153	1239	1324
48°	88	38	115	192	269	346	423	500	576	653	730	807	884	961	1038	1115	1192
46°	90	34	104	174	244	314	384	454	524	594	664	734	804	874	944	1013	1083
44°	92	32	96	160	224	288	352	416	480	544	608	673	737	801	865	929	993
42°	94	30	90	147	205	266	325	384	443	502	562	621	680	739	798	857	917
40°	96	28	84	137	192	247	302	357	412	467	521	576	631	686	741	796	851
38°	98	26	78	128	179	230	282	333	384	435	487	538	589	641	692	743	794
36°	100	24	72	120	168	216	264	312	360	408	456	504	552	600	649	697	745
34°	102	22	66	113	158	203	248	294	339	384	429	475	520	565	610	656	701
32°	104	21	64	106	149	192	235	277	320	363	406	448	491	534	576	619	662
30°	106	20	60	101	141	182	222	263	303	344	384	425	466	506	546	587	627
28°	108	19	57	96	134	173	211	250	288	326	365	403	442	480	519	557	596
26°	110	18	54	91	128	164	201	238	274	311	347	384	421	457	494	531	567
24°	112	17	52	87	122	157	192	227	262	297	332	367	402	437	472	506	541
22°	114	16	50	83	117	150	183	217	250	284	317	351	384	418	451	484	518
20°	116	15	48	80	112	144	176	208	240	272	304	336	368	400	432	464	496
18°	118	15	46	76	107	138	169	200	230	261	292	323	353	384	415	446	476
16°	120	14	44	73	103	133	162	192	221	251	281	310	340	369	399	428	458

225
Sue/4